Traffic Safety
Problem Identification

FY 2002

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Traffic & Safety Bureau
Engineering Division
Montana Department of Transportation
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A. INTRODUCTION

This document was developed in order to identify and analyze trends and problem areas related to traffic safety in Montana. The information contained within this publication originates primarily from traffic crashes occurring on public roadways. Crashes must involve at least one motor vehicle upon these roadways. Many contributing factors are discussed within this analysis. The demographics of the resultant injuries and fatalities along with the drivers and vehicles involved are presented. The analysis is intended to provide traffic safety specialists with the information required to assist in the design of countermeasures and to monitor progress.

Data is first presented on general exposure and demographics. Information is then presented in specific traffic areas and items of interest such as alcohol-involved crashes, restraint usage, crashes involving trucks, motorcycles, bicycles and pedestrians. Current year data are compared to the previous year and the average of the previous five years. Most tables contain ten years of data. The last two lines of the table usually contain the percentage change for these aforementioned comparisons.

The crash record system includes all motor vehicle crashes, which occur on public roadways and are submitted to the Montana Highway Patrol by investigating officers. A crash report is to be completed for any crash resulting in death, injury, or property damage amounting to $1000 or more. These incidents are termed reportable crashes. Many crashes such as single vehicle run off the road, wild animal crashes and minor fender benders are inadvertently not reported even when there is more than $1000 of damage. The reporting level changed from $400 to $1000 on January 1, 2000. This may affect some comparisons, which look at total crash numbers.

The reporting by local law enforcement jurisdictions is voluntary. Fortunately, their reporting is relatively complete. A few non-reportable crash reports are received by the Highway Patrol. These are kept on file, but the data is not entered into the crash records system.

The data elements within the crash record system include information on vehicles, roadway, drivers, passengers, pedestrians, bicyclists, and crash details. The reader must pay close attention to the type of information in the data tables throughout this report. Some tables summarize crash counts, while others summarize the number of drivers, number of vehicles, number of occupants or number of injuries. In addition sections of tables may concern all crashes while other sections contain data for fatal crashes or other subsets of data. Special care must be given to understand what exactly is being summarized within each table.

B. TRAFFIC CRASH AND EXPOSURE STATISTICS

The crash statistics in this publication relate to traffic crashes occurring within Montana. The statistics include information on all people involved in the crash regardless of residency.

Traffic crash and injury counts generally increased during the first seven years of the 1990's. After a decrease in 1997, crashes have been reasonably static during the last three years. Ten years of reportable crash and injury data appear in Table 1. Fatalities were higher during 2000 than in the previous year and injury crashes reached a record high, surpassing 7,000. However, the number of injured persons was down from the previous year. Perhaps belt use is a factor in this decline.

Table 1
Crashes by Severity

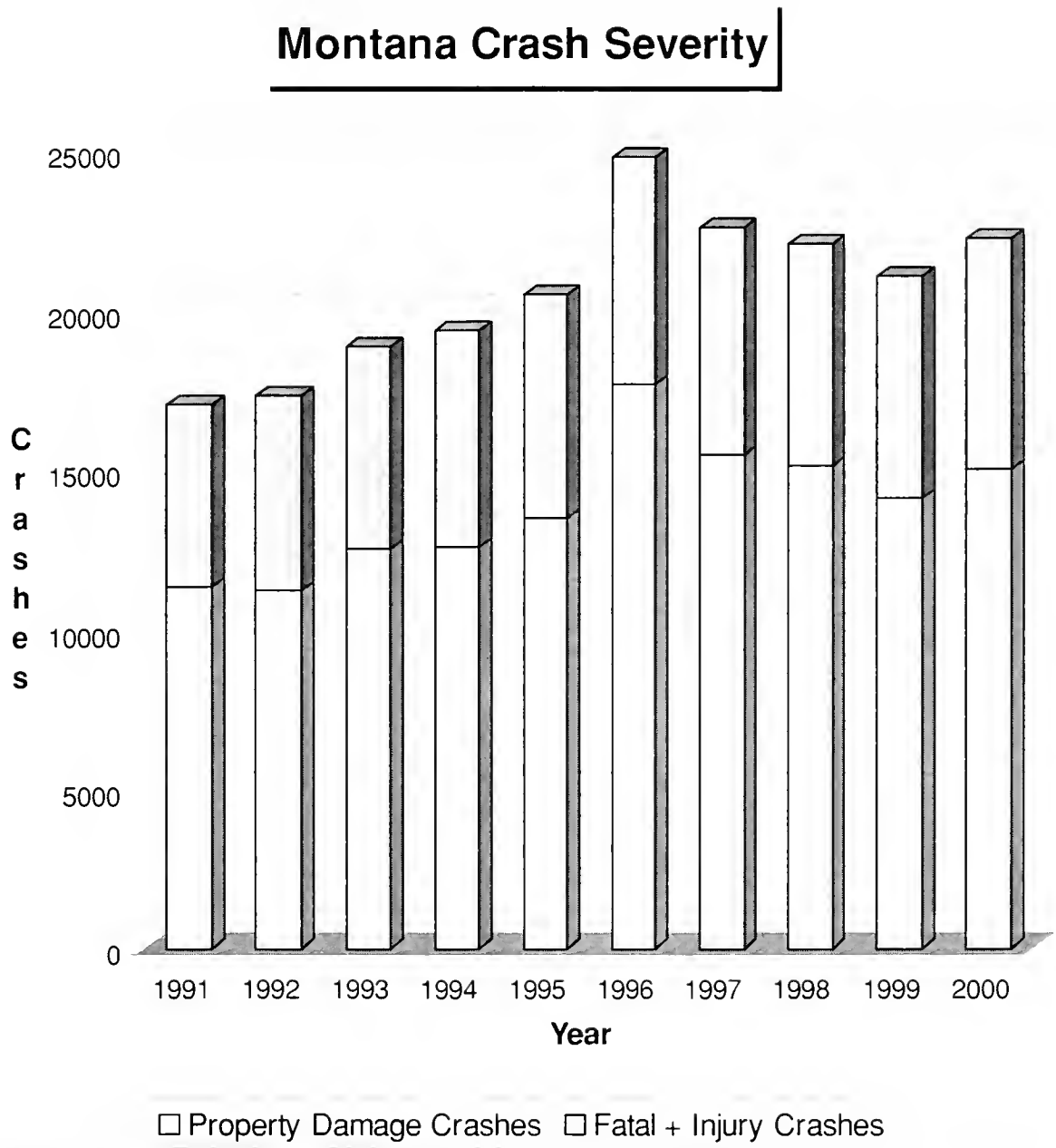
Year	All Crashes	Fatal Crashes	Injury Crashes	Property Damage Crashes	Fatalities	Injuries
1991	17,058	172	5,514	11,355	200	8,449
1992	17,310	170	5,903	11,237	191	8,999
1993	18,839	166	6,144	12,529	194	9,288
1994	19,351	182	6,568	12,601	202	9,903
1995	20,508	186	6,807	13,515	216	10,255
1996	24,882	177	6,980	17,665	198	10,557
1997	22,619	223	6,951	15,445	265	10,688
1998	22,068	208	6,728	15,132	237	10,075
1999	21,078	194	6,769	14,113	220	10,459
2000	22,254	203	7,053	15,000	237	10,264
Chg 1 Yr	+5.6%	+4.6%	+4.2%	+6.3%	+7.7%	-1.9%
Chg 5 Yr	+0.1%	+2.7%	+3.0%	-1.1%	+4.3%	-1.4%

Source: Traffic Information System (TIS) – Montana Department of Transportation

Figure 1 on the following page is a graphic representation of crashes by severity type. Property damage crashes vary greatly from year to year. Much of this variation results from differences in the amount of icy road conditions, especially in urban areas. Property damage crashes were elevated in 1996, because the winter driving was significantly worse than during an average winter.

Injury and severe injury crash counts tend to be more accurate indicators of safety trends in Montana. These crashes better represent change without the variations caused by icy roads. Severe injury crashes are those crashes involving a fatality or an incapacitating injury.

Figure 1


Montana Crash Severity
25000
20000
15000
10000
5000
0
Crashes
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Property Damage Crashes
Fatal + Injury Crashes

There are many variables that can be considered as exposure statistics for the area of traffic safety. These would include number and type of vehicles, number of licensed drivers by age and gender, physical road miles, and the number of vehicle miles driven. Table 2 displays Vehicle Miles Traveled (VMT), which is the estimated number of total miles driven by all vehicles on Montana public roads, licensed drivers and registered motor vehicles. VMT is the exposure number that appears to have the greatest influence on the amount of traffic crashes that occur in Montana.

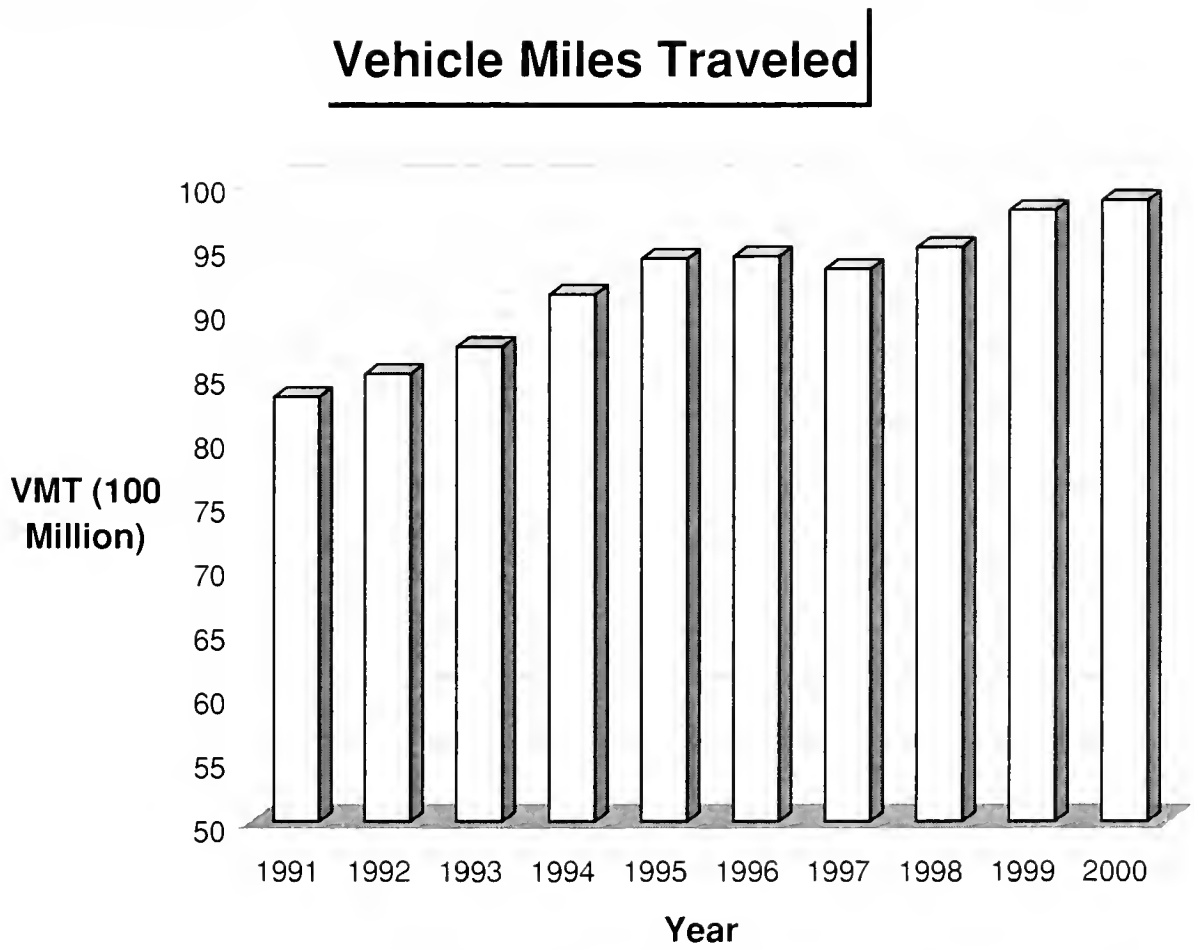
Table 2
Crash Exposure By Factors

Year	VMT (100 Million Miles)	Licensed Drivers	Registered Motor Vehicles (plus trailers)
1991	83.2	NA	880,800
1992	85.0	NA	916,534
1993	87.1	NA	961,745
1994	91.1	NA	984,946
1995	94.0	573,749	1,003,605
1996	94.2	NA	1,010,506
1997	93.2	NA	1,028,570
1998	94.9	646,512	1,042,183
1999	97.8	NA	NA
2000	98.6	678,899	1,009,930
Chg 1 Year	+0.8%	---	---
Chg 5 Year	+4.0%	---	---

Source: VMT – Montana Department of Transportation
Licenses and Registered Vehicles – Department of Justice

The annual vehicle miles traveled values are shown on the following chart. These numbers are almost always increasing somewhat each year. During 1970, the VMT for Montana was 4.8 billion. Now in 2000, this figure is more than double at 9.86 billion. When crash numbers, injuries and fatalities are stable, gains are still being made because of increases in exposure. During instances when decreases occur in these raw numbers, the actual gain is larger than is obvious when prorated by exposure.

Figure 2


Vehicle Miles Traveled
VMT (100 Million)
100
95
90
85
80
75
70
65
60
55
50
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year

The fatality rate for Montana was 7.64 fatalities per hundred million miles traveled during 1969. This rate has been generally decreasing since then. It had decreased to 4.92 in 1980. By 1996, this rate reached an all time low at 2.10. For the year 2000, the fatality rate was at 2.25.

The injury rate decreased slightly to 104.2 and has been showing a small downward trend over the last four years. The crash rate was 225.8, up slightly from 1999. This rate is similar to the levels experienced in Montana during the early 1990's.

Table 3
Statewide Crash Rates
(Per 100 Million Miles Traveled)

Year	Fatality Rate	Injury Rate	Crash Rate
1991	2.41	101.7	205.1
1992	2.25	105.7	203.1
1993	2.23	106.7	216.4
1994	2.22	108.6	212.3
1995	2.29	109.1	218.2
1996	2.10	112.1	263.5
1997	2.84	114.7	242.6
1998	2.50	106.1	232.5
1999	2.25	106.9	215.4
2000	2.40	104.2	225.8
Chg 1 Year	+6.7%	-2.5%	+4.8%
Chg 5 Year	+0.2%	-5.1%	-3.7%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

Figure 3 compares the national fatality rate with the Montana rate. Historically, western rural states have tended to have rates that are above the national average.

Figure 3

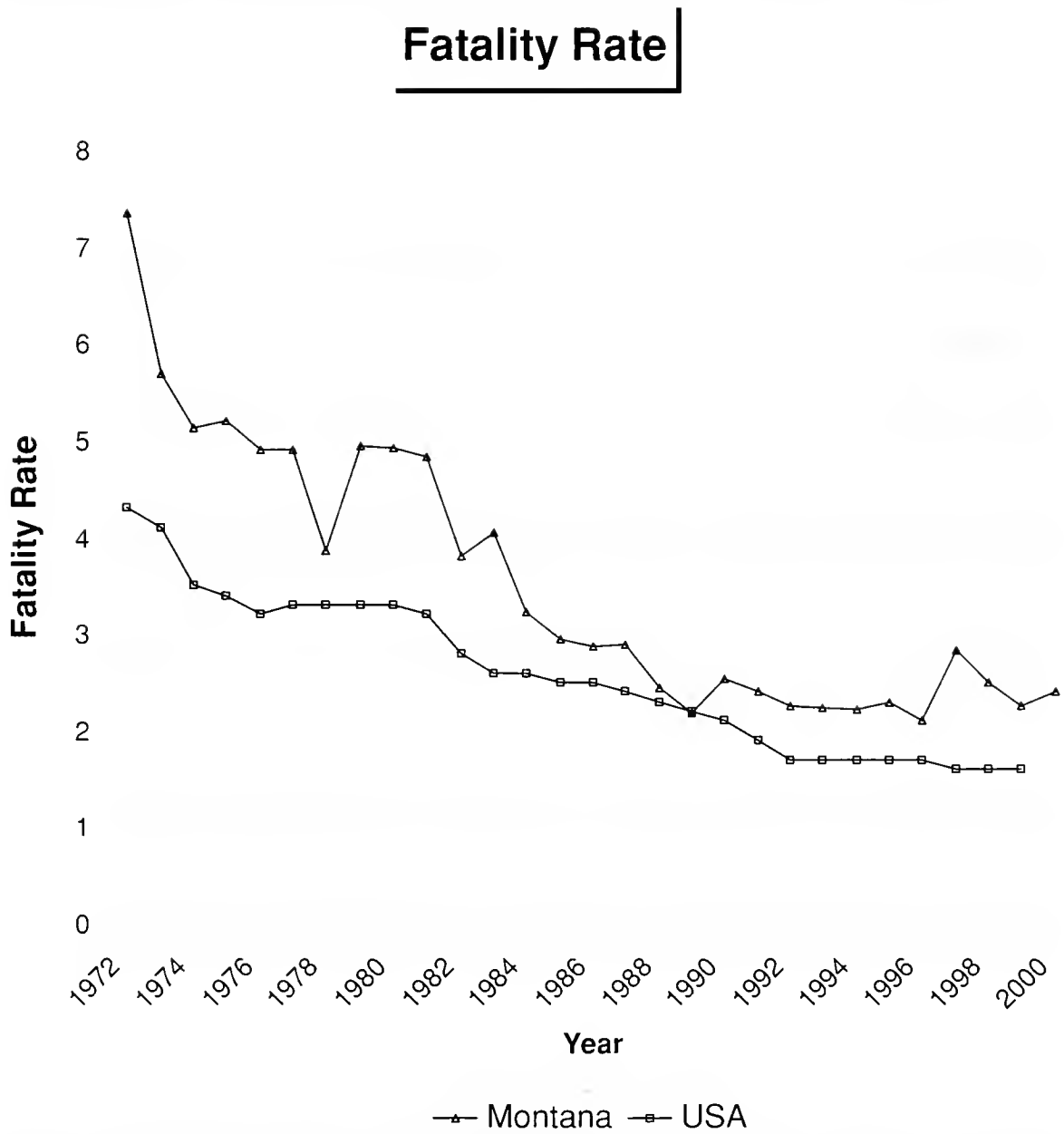

Fatality Rate
Fatality Rate
8
7
6
5
4
3
2
1
0
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
Year
Montana
USA

Table 4 displays the distribution of injury severity to persons involved in motor vehicle crashes in Montana for the last ten years. This table is examining injury severity in order to determine whether restraint use and airbags are saving lives and reducing injury severity.

Table 4
Injury Severity
(persons)

Year	Fatalities	Inca-pacitating	Non Inca-pacitating	Possible Injury	No Injury	Total Passengers
1991	200	2,163	2,638	3,654	25,288	33,943
1992	191	2,232	2,856	3,911	31,974	41,164
1993	194	2,261	2,835	4,192	36,374	45,856
1994	202	2,474	2,970	4,459	37,193	47,298
1995	216	2,405	3,099	4,751	38,911	49,381
1996	198	2,043	3,057	5,457	46,378	57,133
1997	265	1,917	3,187	5,584	42,664	53,617
1998	237	1,872	3,116	5,342	40,847	51,414
1999	220	1,739	3,254	5,759	38,014	48,986
2000	237	1,790	3,325	5,149	43,029	53,530
Chg 1 Yr	+6.9%	+2.9%	+2.2%	-10.6%	+13.2%	+9.3%
Chg 5 Yr	+3.4%	-10.3%	+5.8%	-4.3%	+4.0%	+2.7%

Source: TIS - Montana Department of Transportation

Incapacitating injuries increased slightly after five straight years of decrease. This decrease is very nearly 30% since 1994. Severe injuries (fatalities plus incapacitating injuries) tend to be very costly in economic loss. Figure 4 on the following page shows clearly this history of injuries over time. There seems to be a decrease in incapacitating injuries while non-incapacitating injuries are consistently increasing. One would hope that this is a trend that is being caused by the increases in seat belt usage. The theory is that we are decreasing the severity of injuries, but not necessarily the number of injuries. This change in severity may also be changing because of air bags, improved emergency medical services and more forgiving roadways.

Figure 4

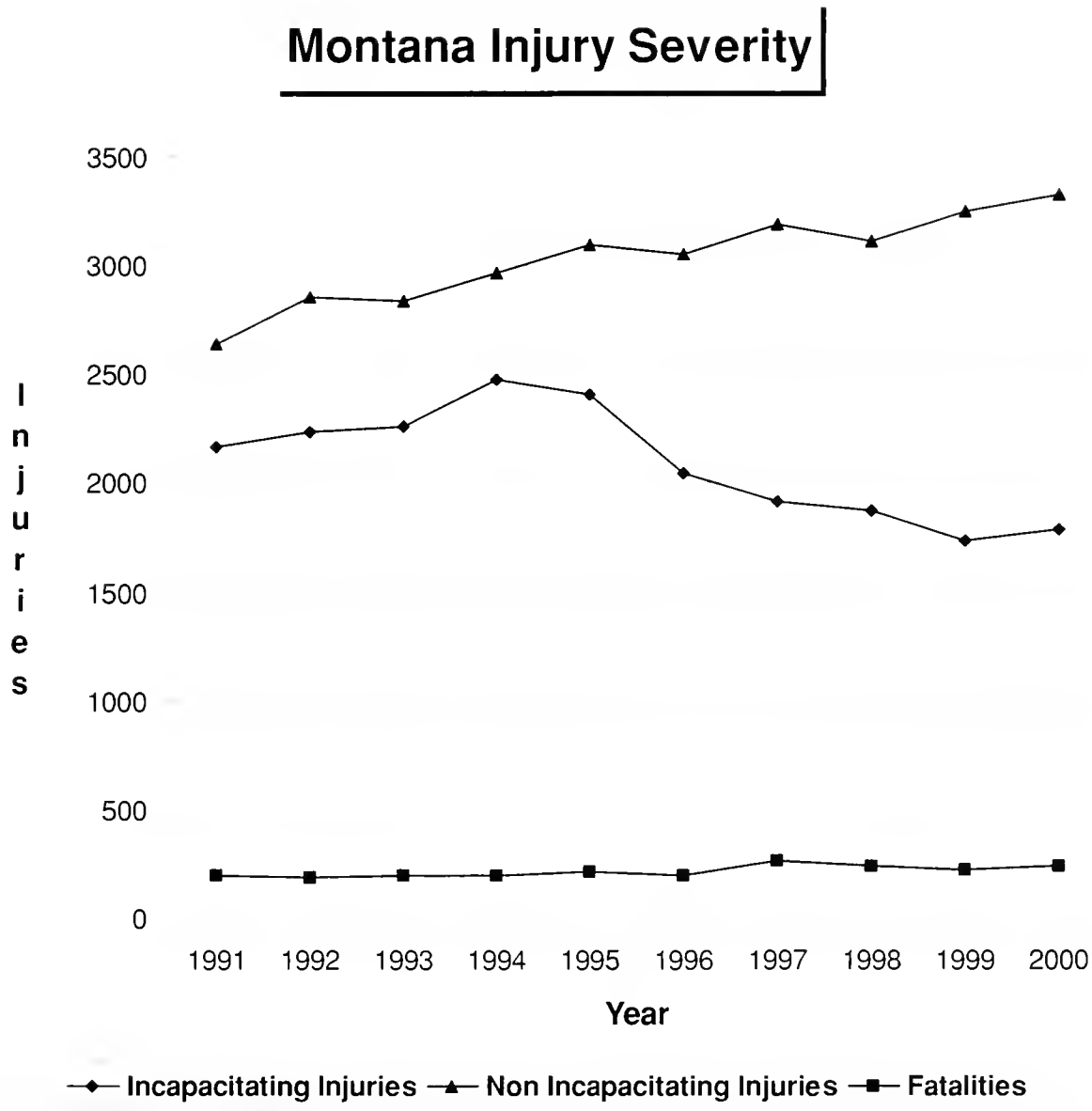

Montana Injury Severity
3500
3000
2500
2000
1500
1000
500
0
Injuries
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Incapacitating Injuries
Non Incapacitating Injuries
Fatalities

Table 5 includes a comparison of crashes by rural or urban location. The percentage of rural crashes in Montana decreased steadily in the 1980's and early 1990's. However that trend has changed in the last seven years with the makeup of crashes now swinging toward rural. The reasons for this may be varied. During the last twenty years, many city dwellers have moved out into the country, but usually just outside of the cities. This may have some effect on the data. In addition, the Billings Police Department has not reported about 50% of their crashes during the last three years, which has decreased the number of urban crashes per year by 1500 to 2000.

Table 5
Rural vs. Urban Crashes

Year	All Crashes	Rural Crashes	Urban Crashes	Percent Rural
1991	17,058	7,969	9,089	46.7%
1992	17,310	7,985	9,325	46.1%
1993	18,839	8,427	10,412	44.7%
1994	19,351	9,190	10,161	47.5%
1995	20,508	9,846	10,662	48.0%
1996	24,822	11,812	13,010	47.6%
1997	22,619	10,921	11,626	48.6%
1998	22,068	10,976	11,007	50.1%
1999	21,078	11,241	9,837	53.3%
2000	22,254	11,637	10,617	52.3%
Chg 1 Year	+5.6%	+3.5%	+7.9%	-1.9%
Chg 5 Year	+0.1%	+6.2%	-5.4%	+5.6%

Source: TIS - Montana Department of Transportation

Rural crashes because of the speed involved tend to have many more fatalities and serious injuries than urban crashes. There were 18 fatalities, which occurred on urban roads during 2000, while 219 fatalities occurred on rural roads. Similarly there were 333 incapacitating injuries on urban roads while 1457 of these injuries occurred in the rural setting. Rural crashes averaged 1.31 involved vehicles, while urban crashes averaged 1.97 vehicles. Crash configurations are much different. Most rural crashes (71.1%) involve just one vehicle, while most urban crashes (81.7%) involve two vehicles.

Table 6
Number of Involved Vehicles – Rural vs. Urban Crashes

Vehicles	Rural		Urban	
	Crashes	Percent	Crashes	Percent
1	8,271	71.1%	1,188	11.2%
2	3,172	27.2%	8,676	81.7%
3	167	1.4%	636	6.0%
4	21	0.2%	108	1.0%
>=5	6	0.1%	11	0.1%
Total	11,637	100.0%	10,619	100.0%

When examining type of collision crashes for multiple vehicle collisions, rural crashes were most often caused by rear end collisions. This was followed by right angle crashes and sideswipe crashes. For Urban areas, right angle crashes were the most common collision type, followed by rear end crashes and other collision types.

Table 7
Type Of Collision – Rural vs. Urban Crashes
(Two or More Vehicles)

Type of Collision	Rural		Urban	
	Crashes	Percent	Crashes	Percent
Rear End	1,123	33.4%	2,670	28.3%
Sideswipe – Same Direction	391	11.6%	638	6.8%
Sideswipe – Opposite Direction	257	7.6%	177	1.9%
Left Turn – Same Direction	111	3.3%	135	1.4%
Left Turn – Opposite Direction	132	3.9%	382	4.1%
Right Angle	791	23.5%	3,562	37.8%
Right Turn – Same Direction	22	0.7%	88	0.9%
Right Turn – Opposite Direction	9	0.3%	22	0.2%
Head On	202	6.0%	145	1.5%
Other	328	9.7%	1,612	17.1%
Total	3,366	100.0%	9,431	100.0%

Economic loss from motor vehicle crashes is shown for recent years in Table 8. The Montana Highway Patrol calculates these losses using estimates for average crashes, injuries and fatalities, which are provided by the National Safety Council. These estimates cover wage loss, medical expense, insurance administration and property damage costs. Indirect costs for human suffering and loss are more difficult to quantify and are not included as part of this estimate.

Table 8
Economic Loss in Crashes
(Millions of Dollars)

Year	Economic Loss
1991	$238
1992	$249
1993	$220
1994	$235
1995	$479*
1996	$476
1997	$509
1998	$591
1999	$677
2000	$712
Change 1 Year	+5.2%
Change 5 Year	+30.3%

* Changed method of loss calculation
Source: Montana Highway Patrol

It is evident that the trend in average cost has risen in these ten years. Clearly, since the costs are large and increasing, there is a significant impact on the state economy. Last year the economic loss passed seven-tenths of a billion dollars for Montana.

Table 9 shows vehicle miles traveled (VMT) for 2000 and crash and injury rates based on VMT for each county. VMT was obtained for on-system roads in Montana from Traffic Data Collection Section of Montana Department of Transportation. The VMT for Montana off-system roadways was estimated by prorating the remaining mileage on a population basis and is not an official MDT estimate. This estimate is then added to the MDT on-system value for each county. This final county estimate, although reasonable, is merely a rough estimate. Counties are grouped according to population size within the table. An 'x' is shown at right for counties that are 10% above the group average for either of the two rates. It should be noted that within the nine counties with population over 20,000 there occur 68% of the crashes and 67.5% of the injuries.

Table 9

Injury Rates by County – 2000

County	Population (2000)	Vehicle Miles (2000) (millions)	Crashes	Crash Rate (per million)	Injuries	Injury Rate (per million)	
Population greater than 20,000							
Yellowstone	129,352	782.6	2183	2.79	1179	1.51	
Missoula	95,802	804.3	2376	2.95	1192	1.48	
Cascade	80,357	541.5	2645	4.88	950	1.75	X
Flathead	74,471	780.9	1905	2.44	1103	1.41	
Gallatin	67,831	722.3	1688	2.34	658	0.91	
Lewis & Clark	55,716	422.2	2090	4.95	749	1.77	X
Ravalli	36,070	363.3	842	2.32	405	1.11	
Silver Bow	34,606	250.0	773	3.09	325	1.30	
Lake	26,507	357.6	634	1.77	371	1.04	
Total/Ave	600,712	5024.7	15,136	3.01	6,932	1.38	
Population 10,000 – 19,999							
Lincoln	18,837	205.4	338	1.65	182	0.89	X
Hill	16,673	136.4	419	3.07	144	1.06	X
Park	15,694	233.2	440	1.89	166	0.71	X
Glacier	13,247	150.0	212	1.41	153	1.02	X
Big Horn	12,671	273.5	227	0.83	169	0.62	
Fergus	11,893	129.9	299	2.30	116	0.89	X
Custer	11,696	128.2	323	2.52	112	0.87	X
Roosevelt	10,620	116.8	145	1.24	107	0.92	X
Sanders	10,227	150.3	207	1.38	123	0.82	
Jefferson	10,049	245.5	380	1.55	151	0.62	
Total/Ave	131,607	1769.2	2990	1.69	1423	0.80	

Table 9 (continued)

Injury Rates by County – 2000

County	Population (1999 Est)	Vehicle Miles (2000) (millions)	Crashes	Crash Rate (per million)	Injuries	Injury Rate (per million)	
Population 5,000-9,999							
Richland	9,667	103.7	294	2.84	98	0.95	X
Carbon	9,552	144.5	249	1.72	132	0.91	X
Deer Lodge	9,417	116.1	136	1.17	86	0.74	X
Rosebud	9,383	145.6	164	1.24	74	0.92	X
Beaverhead	9,202	167.4	211	1.26	120	0.72	X
Dawson	9,059	131.6	228	1.73	71	0.54	X
Stillwater	8,195	171.1	274	1.60	137	0.80	X
Valley	7,675	97.4	170	1.75	82	0.84	X
Powell	7,180	182.8	213	1.16	91	0.50	
Blaine	7,009	93.8	104	1.11	60	0.64	
Madison	6,851	127.7	137	1.07	45	0.35	
Teton	6,445	86.8	147	1.69	69	0.79	X
Pondera	6,424	94.8	84	0.89	44	0.46	
Chouteau	5,970	94.2	108	1.15	47	0.50	
Toole	5,267	87.7	118	1.35	41	0.47	
Total/Ave	117,296	1845.2	2637	1.43	1197	0.65	
Population less than 5,000							
Phillips	4,601	63.9	98	1.53	70	1.10	X
Musselshell	4,497	62.4	97	1.55	60	0.96	X
Broadwater	4,385	113.3	150	1.32	81	0.72	X
Sheridan	4,105	46.8	77	1.64	22	0.47	X
Mineral	3,884	200.3	288	1.44	85	0.42	X
Sweet Grass	3,609	135.9	126	0.93	45	0.33	
Fallon	2,837	37.2	19	0.51	13	0.35	
Granite	2,830	108.1	121	1.12	50	0.46	
Judith Basin	2,329	60.2	70	1.16	29	0.48	
Wheatland	2,259	39.9	44	1.10	20	0.50	
Liberty	2,158	26.7	16	0.60	11	0.41	
Daniels	2,017	23.9	34	1.42	24	1.00	X
McCone	1,977	37.0	42	1.14	24	0.65	X
Meagher	1,932	30.3	38	1.25	29	0.96	X
Powder Rvr	1,858	41.3	49	1.19	13	0.31	
Carter	1,360	26.0	13	0.50	13	0.50	
Garfield	1,279	26.5	23	0.87	25	0.94	X
Prairie	1,199	35.3	45	1.27	14	0.40	
Wibaux	1,068	28.4	53	1.86	41	1.44	X
Golden Vally	1,042	26.9	26	0.97	17	0.63	
Treasure	861	34.1	52	1.52	21	0.62	X
Petroleum	493	11.4	10	0.88	5	0.44	
Total/Ave	52,580	1215.8	1491	1.23	712	0.59	

C. CRASH DEMOGRAPHICS

1. Gender of Drivers

Male drivers are more likely to be involved in crashes than females, when prorated by the number of licensed drivers. However, when based upon average national vehicle miles driven by gender, this difference in crash rates largely disappears. No state statistics on miles traveled by gender are available. National estimates by gender are the only available information. These estimates show that male drivers account for over 60% of the miles traveled.

Driver involvement in crashes by gender is shown in Table 10. While male involvement is 60.2% of all crashes, involvement by females has been increasing consistently over the past 20 years. During the last four years, this trend seems to be slowing.

Table 10
Driver's Gender in Crashes

Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1991	9,949	16,575	26,524	37.5%	62.5%
1992	10,382	16,757	27,139	38.3%	61.7%
1993	11,567	18,523	30,090	38.4%	61.6%
1994	11,745	18,661	30,415	38.6%	61.4%
1995	12,420	19,687	32,110	38.7%	61.3%
1996	14,932	23,326	38,258	39.0%	61.0%
1997	13,943	20,915	34,858	40.0%	60.0%
1998	12,818	19,382	32,200	39.8%	60.2%
1999	12,248	18,904	31,152	39.3%	60.7%
2000	13,237	20,008	33,245	39.8%	60.2%
Chg 1 Year	+8.1%	+5.8%	+6.7%	+1.3%	-0.8%
Chg 5 Year	-0.3%	-2.1%	-1.4%	+1.1%	-0.7%

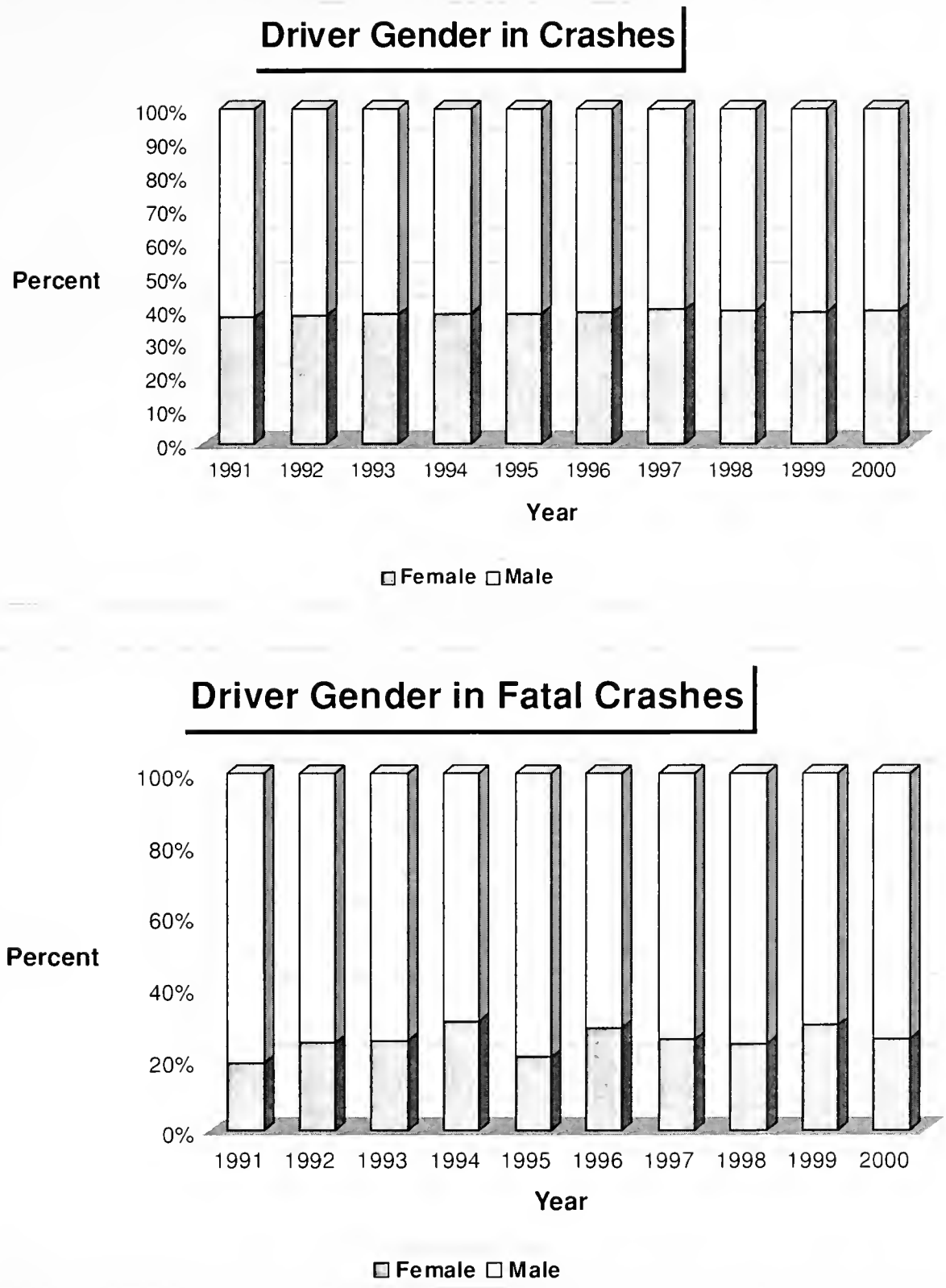
Men have a disproportionate involvement in fatal crashes. Past studies have shown that men have higher involvement in overturns, other non-collision crashes, crashes into fixed objects and the striking of animals. Much of this is due to men's much higher involvement in alcohol-related crashes. Table 11 follows with information on fatal crashes and figure 5 on the following page summarizes this gender data.

Table 11
Driver's Gender in Fatal Crashes

Year	Gender of Drivers			Percent of Total	
	Female	Male	Total	Female	Male
1991	43	185	228	18.9%	81.1%
1992	54	167	221	24.4%	75.6%
1993	55	163	218	25.2%	74.8%
1994	76	173	249	30.5%	69.5%
1995	52	202	254	20.5%	79.5%
1996	71	177	248	28.6%	71.4%
1997	74	218	292	25.3%	74.7%
1998	68	213	281	24.2%	75.8%
1999	78	187	265	29.4%	70.6%
2000	77	225	302	25.5%	74.5%
Chg 1 Year	-1.3%	+20.3%	+14.0%	-13.3%	+5.5%
Chg 5 Year	+12.2%	+12.8%	+12.7%	-0.4%	+0.1%

Source: TIS – Montana Department of Transportation

Figure 5


Driver Gender in Crashes
Percent
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Female
Male
Driver Gender in Fatal Crashes
Percent
100%
80%
60%
40%
20%
0%
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Female
Male

2. Age of Drivers

This section will look at the involvement of traffic crashes versus the age of the driver. These crash rates in Montana can help traffic safety groups make decisions on targeting specific age groups. Table 12 contains data related to age of driver in crashes.

Table 12
Crashes by Age of Driver
(2000 Crash Data)

Age	Licensed Drivers (2000)	Drivers in Crashes	Crashes per 1000 Licenses	Drivers in Fatal Crashes	Fatal Crashes per 1000 Licenses
Under 16	4,982	1,107	222	7	1.41
16	9,783	1,395	143	9	0.92
17	11,287	1,508	134	10	0.89
18	12,616	1,564	124	12	0.95
19	13,100	1,229	94	5	0.38
20	13,246	1,166	88	6	0.45
Under 21	65,014	7,969	123	49	0.75
21-24	45,640	3,385	74	27	0.59
25-29	53,527	2,926	55	26	0.49
30-39	115,938	5,551	48	59	0.51
40-49	147,733	5,746	39	47	0.32
50-59	111,913	3,735	33	40	0.36
60-69	69,863	1,870	27	26	0.37
70+	69,271	2,087	30	28	0.40

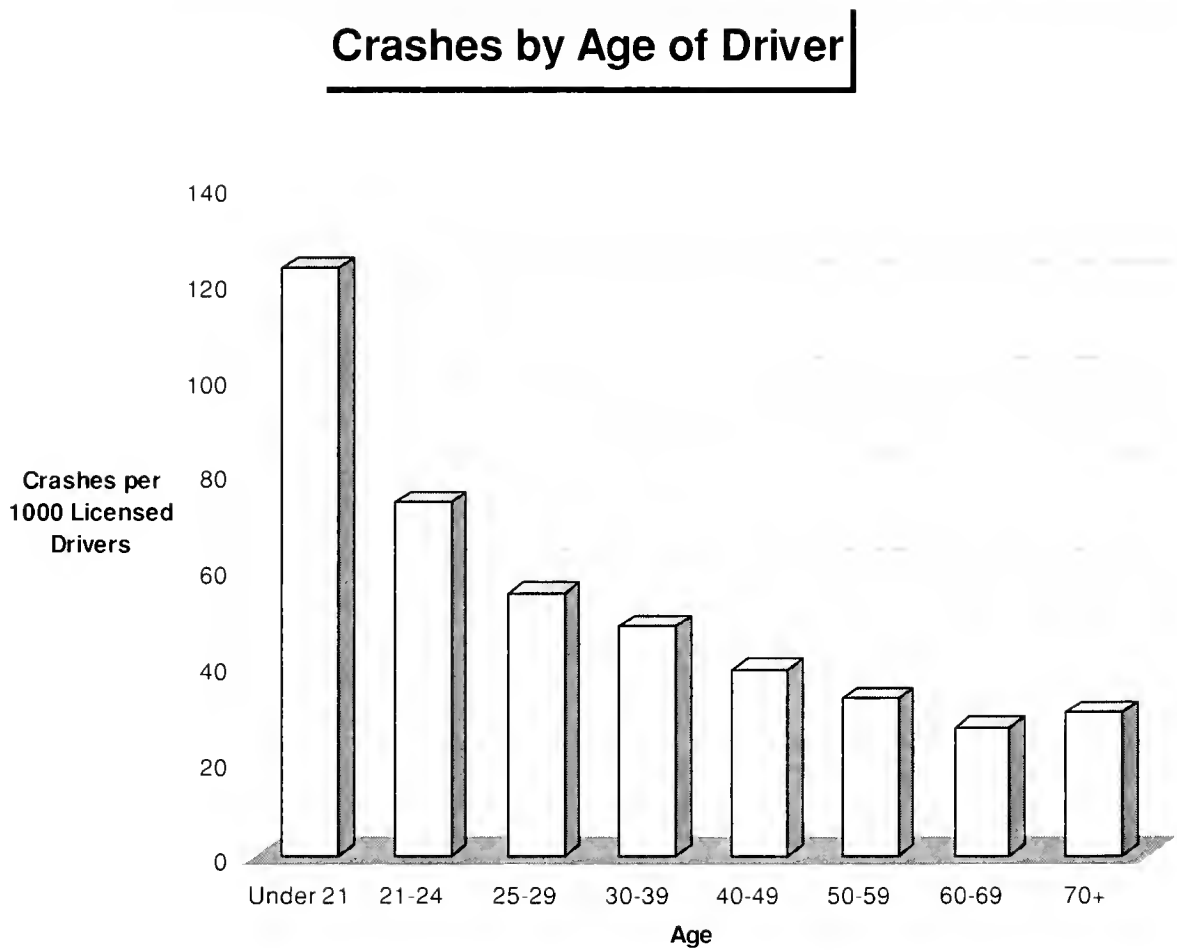
Source: TIS – Montana Department of Transportation
Motor Vehicle Division – Department of Justice

Young drivers are over-represented in traffic crashes based upon the number of licensed drivers. Nationally the number of miles driven by teens is less than for drivers of all ages. In fact teens drive 35% fewer miles than average adults. If Montana teens are similar to the nation, then their rate of crashes per vehicle miles driven would be even more extreme than the rate that is shown per licensed driver. Drivers between 15 and 20 years of age were involved in 123 crashes per thousand drivers in 2000. Every

other age group over 20 years of age had a rate of 74 or less crashes per thousand licensed drivers. Each higher age group had fewer crashes per licensed driver than the previous age group, with the exception of the over 70 group. It could be suggested that experience and/or risk taking are factors in this difference by age. Certainly the change for each year of age between 15 and 20 supports the supposition that experience is a strong factor. It is of interest to note that a 15 year-old driver is over 8 times more likely to be in a crash than a driver in their sixties.

Similarly, the fatal crash rate is lower for older drivers. Drivers under 21 were involved in .75 fatalities per thousand licensed drivers. All age groups above 25 were involved at a rate of 0.51 or less fatalities per thousand drivers. A 15 year-old is over four times more likely to be involved in a fatal crash than a driver in their forties. The following chart shown on figure 6 shows this change in crash incidence by age of driver.

Figure 6


Crashes by Age of Driver
Crashes per 1000 Licensed Drivers
140
120
100
80
60
40
20
0
Under 21
21-24
25-29
30-39
40-49
50-59
60-69
70+
Age

The following table shows the percentage of elderly drivers and young drivers out of all drivers. The data is presented from 1983 to present in order to show long-term trends.

Table 13
Drivers in Crashes
Elderly and Youthful

	Percent of Drivers In Crashes Under Age		Percent of Drivers in Crashes of this Age or Older		
Year	18	21	55	65	75
1983	10.3%	24.8%	13.0%	6.5%	2.3%
1984	10.5%	23.8%	13.2%	6.8%	2.3%
1985	10.8%	22.9%	13.7%	7.1%	2.5%
1986	12.1%	23.8%	14.7%	7.8%	2.9%
1987	12.9%	24.8%	15.2%	8.2%	3.0%
1988	11.9%	23.7%	15.2%	8.6%	3.1%
1989	10.9%	22.9%	14.4%	7.9%	2.9%
1990	11.8%	23.7%	15.5%	8.8%	3.4%
1991	11.5%	22.4%	15.5%	8.9%	3.5%
1992	12.1%	23.3%	15.6%	9.0%	3.6%
1993	11.7%	22.8%	15.2%	8.5%	3.6%
1994	12.3%	23.2%	15.5%	9.0%	3.9%
1995	12.7%	23.9%	15.4%	8.9%	3.6%
1996	11.1%	22.0%	15.5%	8.7%	3.5%
1997	12.0%	23.0%	16.1%	9.0%	4.0%
1998	11.9%	23.3%	16.3%	9.0%	3.9%
1999	12.6%	24.3%	16.6%	9.1%	4.1%
2000	12.1%	24.0%	16.6%	8.7%	3.9%
Chg 1 Year	-4.0%	-1.2%	---	-4.4%	-4.9%
Chg 5 Year	+0.3%	+3.0%	+3.9%	-2.7%	+2.1%

Source: TIS - Montana Department of Transportation

The percentage of crashes involving young drivers has not changed significantly during the last 17 years. There has been some increase during the last five years and these small fluctuations for the most part represent changes in the population of this group.

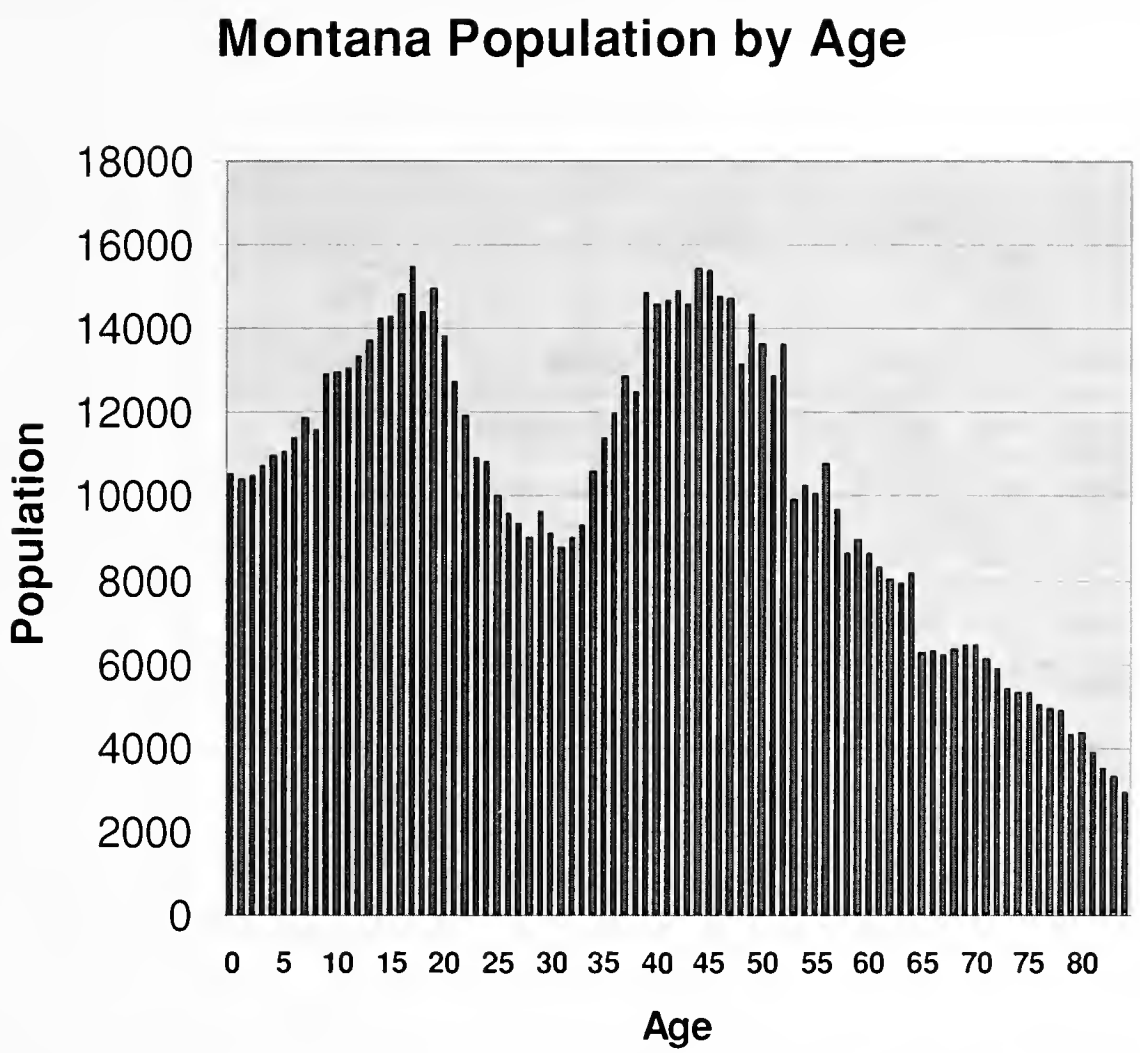
Elderly drivers have experienced large changes during this period. People are living longer and older drivers now make up a larger percentage of licensed drivers in Montana. During 1983, only 2.3% of drivers involved in crashes were 75 and over. This percentage in 2000 was at 3.9%. Similarly, those 65 and over have changed from 6.5% to 8.7%. Those 55 and over have changed from 13.0% to 16.6%.

In order to envision the challenges before us in the traffic safety area, the population by age estimate for 1999 is next presented in figure 7 on the following page. During 1999, the baby boom population seemed to span the age group from 39-52. There is another baby boom from age 9-20. It should be noted that there are more than 15,000 Montana citizens for each of the ages 17, 44 and 45. Yet, there are less than 9,000 31 year olds.

What does this mean to traffic safety? It means that over the next 20-25 years there will be steady growth in the number of higher risk drivers over 60 years of age. This will be a great concern of traffic safety. Currently, and over the next few years, we are in the midst of a large increase in the number of teen and young adult drivers. This is the highest risk group in traffic safety.

These population figures are being noted because of the special challenges that they present to traffic safety. It will be doubly hard in the near future to show improvement in the traffic safety arena with these likely increases in the number of elderly and young adult drivers. We should be able to often show improvements in rates, but it will be much more difficult to decrease the number of incidents relating to these age groups.

Figure 7


Montana Population by Age
Population
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80
Age

3. Gender of Injuries

Injury involvement by gender is shown below in Table 14. In 1997, females for the first time had more injuries resulting from traffic crashes. This has not occurred since and there appears to be a downward trend in the percentage of injuries to females. There has been a slow and steady increase in vehicle miles traveled for women nationally over the past few decades. This would explain the general increase in injury percentage until 1997. It is doubtful that vehicle miles traveled for women would be decreasing over the last three years. Men still account for about 70% of the fatalities.

Table 14
Injuries by Gender

Year	Injuries			Fatalities		
	Female	Male	Percent Female	Female	Male	Percent Female
1991	3984	4449	47.2%	54	146	27.0%
1992	4259	4755	47.2%	54	137	28.3%
1993	4515	4769	48.6%	73	121	37.6%
1994	4791	5114	48.4%	69	133	34.2%
1995	4961	5288	48.4%	70	145	32.6%
1996	5206	5346	49.3%	69	129	34.8%
1997	5377	5322	50.3%	97	168	36.6%
1998	4634	4871	48.8%	72	165	30.4%
1999	4769	5015	48.7%	73	147	33.2%
2000	4957	5305	48.3%	70	165	29.8%
Chg 1 Yr	+3.9%	+5.8%	-0.8%	-4.1%	+12.2%	-10.2%
Chg 5 Yr	-0.6%	+2.6%	-1.6%	-8.1%	+9.4%	-11.1%

Source: TIS – Montana Department of Transportation

4. Age of Injuries

Injury involvement by age is shown below. There has been a significant increase of injuries in the age groups 35 and over. This parallels the fact that the baby boom is in these age groups and in addition there are many more senior citizens in the population. At the same time, the age group containing 25 to 34 year old injuries has decreased. The population numbers of this age group is down in recent years. It should be noted that the 15-19 crash numbers are very high, especially when you consider that all age groups over 25 include 10-year age segments compared to only 5 year segments for those groups below 25.

Table 15
Injuries by Age (excludes fatalities)

Year	0-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75+
1991	887	1841	1169	1637	1204	630	418	336	233
1992	910	1980	1333	1695	1227	735	414	341	273
1993	907	2018	1279	1755	1340	750	475	391	287
1994	980	2192	1398	1775	1433	873	495	356	316
1995	1016	2365	1364	1739	1530	956	510	391	291
1996	1025	2229	1311	1776	1677	1054	598	466	318
1997	1080	2422	1331	1695	1611	1117	555	447	327
1998	1012	2067	1236	1473	1398	1040	555	407	323
1999	1014	2069	1220	1311	1430	1027	524	355	325
2000	1053	2273	1368	1476	1459	1259	638	399	336
Chg 1	+3.8%	+9.9%	+12.1%	+12.6%	+2.0%	+22.6%	+21.8%	+12.4%	+3.4%
Chg 5	+2.3%	+1.9%	+5.8%	-7.7%	-4.6%	+21.2%	+16.3%	-3.4%	+6.1%

Source: TIS – Montana Department of Transportation

Fatalities by age are presented below. It appears that fatalities for those who are 25-34 are decreasing. At the same time, fatalities are increasing in all age groups over 35. Table 16 presents 10 years of data with the average reported for each age group.

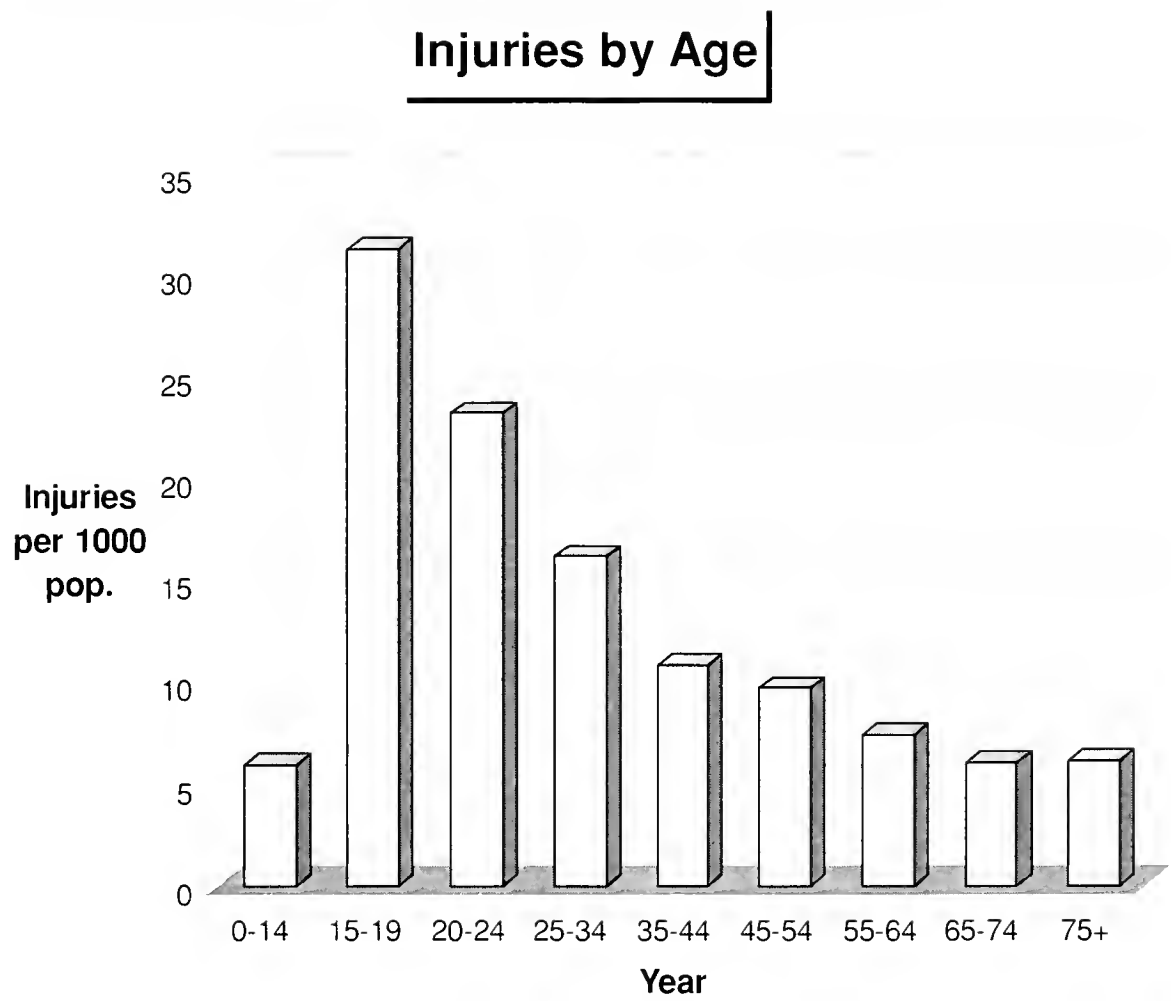
Table 16
Fatalities by Age

Year	0-14	15-19	20-24	25-34	35-44	45-54	55-64	65-74	75+
1991	7	17	37	44	35	11	18	19	12
1992	13	26	29	48	29	13	12	14	7
1993	2	35	36	38	27	18	14	12	12
1994	16	30	21	40	30	26	9	13	17
1995	18	27	17	36	34	24	22	14	23
1996	12	19	33	29	37	25	13	13	17
1997	13	35	31	38	42	42	20	18	24
1998	10	29	26	32	41	34	18	20	27
1999	11	39	28	30	34	31	19	11	17
2000	18	37	27	44	33	26	22	11	17
Ave	12.0	29.4	28.5	37.9	34.2	25.0	16.7	14.5	17.3

Source: TIS – Montana Department of Transportation

Figure 8 on the following page shows injuries by age per 1000 population. It is quite evident from this chart of the high danger to teens and young adults.

Figure 8


Injuries by Age
Injuries per 1000 pop.
35
30
25
20
15
10
5
0
0-14
15-19
20-24
25-34
35-44
45-54
55-64
65-74
75+
Year

D. TRAFFIC SAFETY PUBLIC OPINION SURVEY

The Traffic & Safety Bureau has contracted for a public opinion survey with the Department of Public Health & Human Services since 1984. This survey is an ongoing monthly survey with a sample size of approximately 250 Montana adults per month. A subcontractor performs the surveying using telephone interviews. The survey is part of the Center for Disease Control (CDC) Behavioral Risk Factor Surveillance System (BRFSS). The Traffic Safety Bureau has been allowed to add several traffic safety related questions to this survey. Table 17 on the following two pages contains the results of some of these questions from the 1991 – 2000 surveys.

The continuity of the data allows us to track public sentiment concerning highway safety. Montanans support strong efforts to enforce impaired driving laws. Over 94% of respondents support this effort. Support of the seat belt law continues to be very high. The level of support for a law in 1985 was 42%, while currently the law receives support from 84% of Montanans.

Education on the drinking and driving issue showed positive results during the 1980's, and continues to remain at those levels in the nineties. More than 62% of Montanans know that drinks of wine, beer and whisky are equally intoxicating. This value was at 35% in 1984. Montanans are also becoming more aware of the legal level of blood alcohol and what it means. There are more people each year that think the legal BAC level is .08 even though it is remains at .10. Of those who answered the question on the required number of drinks in an hour that would put them at a blood alcohol content of .10, thirty three percent believe that it would require 2 drinks, 29% believe that it will require 3 drinks and another 22% believe that it will require just 1 drink. When respondents are asked whether problem drinkers should have their licenses reinstated before they have their problem under control, eight-one percent respond "no".

Public support for a motorcycle helmet law is above 73%. Table 15 on the following two pages presents the survey results from some of the questions.

Table 17 a

Traffic Safety Public Opinion Survey

Year	Should licenses be reinstated to problem drinkers before problem is under control?	Which is most intoxicating? Beer, Wine or Whisky	Do you support the mandatory seat belt law?
	No	All Same	Yes
1991	88.7%	68.0%	77.1%
1992	88.8%	64.2%	79.2%
1993	87.2%	63.5%	81.4%
1994	86.0%	60.8%	80.8%
1995	85.8%	52.1%	80.9%
1996	83.1%	64.4%	82.5%
1997	83.7%	64.0%	82.4%
1998	78.5%	64.3%	83.4%
1999	77.2%	64.2%	81.2%
2000	81.6%	62.5%	84.2%
Chg 1 Year	+5.7%	-2.6%	+3.7%
Chg 5 Year	-0.1%	+1.1%	+2.6%

Source: Traffic Safety Bureau – Montana Department of Transportation

Table 17 b

Traffic Safety Public Opinion Survey

Year	What is the legal level of Blood Alcohol? (BAC)	Where is best location for a child seat within a car?	Would you support a mandatory helmet law?
	.10	Middle of back seat	Yes
1991	40.8%	---	78.9%
1992	43.6%	---	78.1%
1993	36.4%	---	77.7%
1994	40.3%	---	75.8%
1995	39.9%	---	72.8%
1996	41.4%	---	70.9%
1997	37.9%	---	72.6%
1998	37.4%	29.3%	72.2%
1999	35.4%	---	69.8%
2000	33.0%	41.3%	73.6%
Chg 1 Year	-6.8%	---	+5.4%
Chg 5 Year	-14.1%	---	+2.7%

Source: Traffic Safety Bureau – Montana Department of Transportation

E. TRAFFIC SAFETY AREAS OF CONCERN

1. Alcohol Involvement in Crashes

Alcohol related crashes accounted for 9.9 percent of all reported traffic crashes during 2000. While this percentage is above the all time low reached in 1996, it is still well below the 22.3% of alcohol related crashes reported during 1983. The city of Billings no longer reports many minor crashes. This loss of approximately 1500 crashes per year has affected the percentage of alcohol related crashes.

Alcohol related crashes tend to result in more severe injuries than do crashes with no alcohol involvement. During the early 80's, fatalities related to alcohol accounted for as much as 62% of all fatalities. Last year, alcohol related fatalities were at 36.8%. Table 18 below presents the statewide alcohol related crash counts.

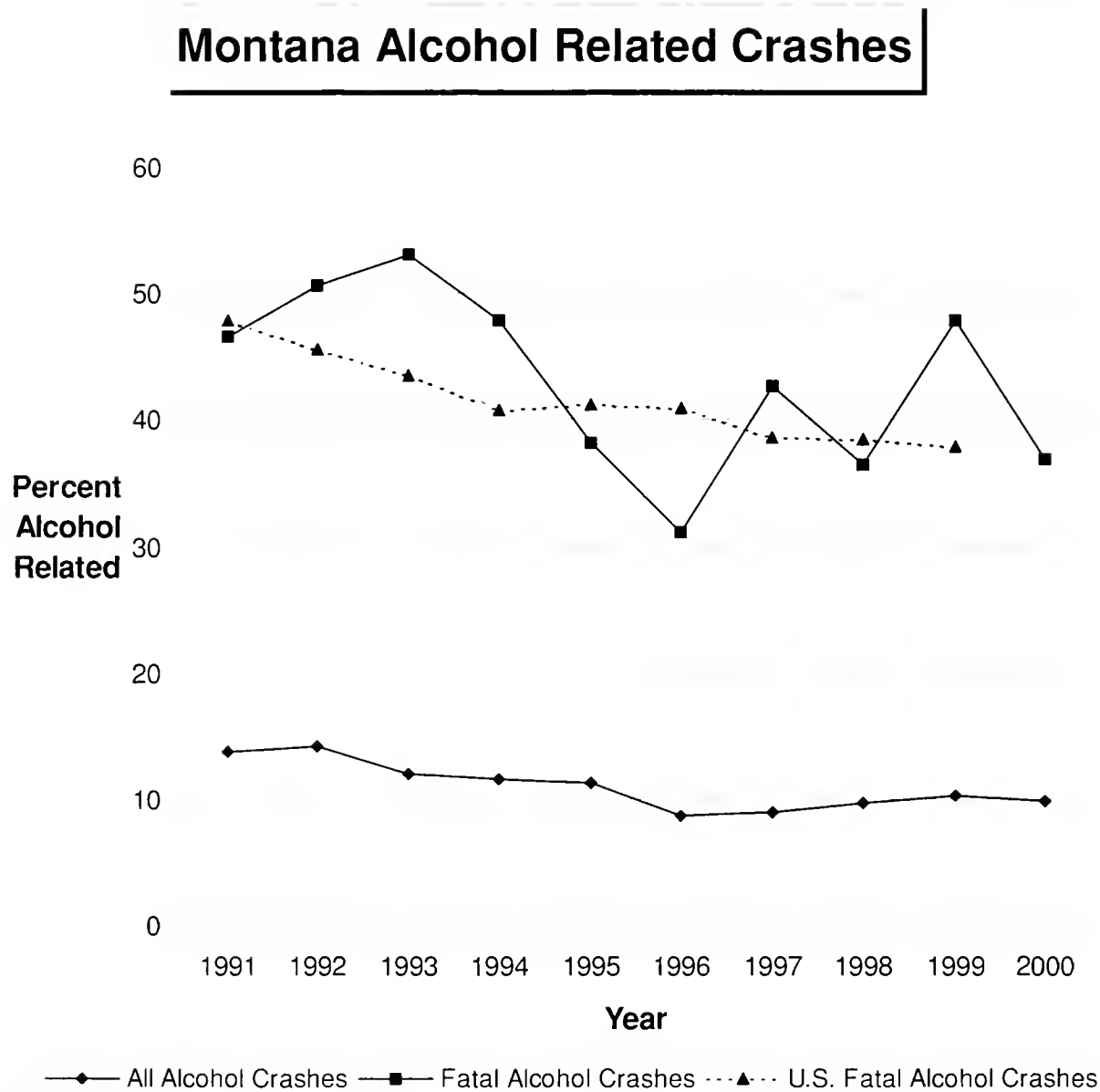
Table 18
Alcohol Related Crashes

Year	Fatal Crashes		All Crashes	
	Alcohol Related	Percent of Total	Alcohol Related	Percent of Total
1991	80	46.5%	2332	13.7%
1992	86	50.6%	2437	14.1%
1993	88	53.0%	2261	12.0%
1994	87	47.8%	2245	11.6%
1995	71	38.2%	2313	11.3%
1996	55	31.1%	2156	8.7%
1997	95	42.6%	2016	8.9%
1998	76	36.5%	2142	9.7%
1999	93	47.9%	2177	10.3%
2000	74	36.8%	2211	9.9%
Chg 1 Year	-20.4%	-23.2%	+1.6%	-3.9%
Chg 5 Year	-5.1%	-6.3%	+2.3%	+1.2%

Source: TIS - Montana Department of Transportation

Figure 9 on the following page compares the Montana percentage of alcohol related crashes with U.S. values.

Figure 9


Montana Alcohol Related Crashes
60
50
40
30
20
10
0
Percent Alcohol Related
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
All Alcohol Crashes
Fatal Alcohol Crashes
U.S. Fatal Alcohol Crashes

Next, we examine alcohol related crashes by county. The final column of Table 19 shows the percentage of crashes with alcohol involvement in the county. There is a tendency for the larger urban counties to have a lower percentage of alcohol involvement in crashes. It is not known whether this implies counties with higher populations truly have less alcohol involvement because of alcohol education and related activities, or whether the larger number of intersection related fender benders reduces the percentage of alcohol involvement. It is felt that these lower percentages result from a combination of these and possibly other factors. In addition, there are some enforcement agencies, which appear not to be careful in determining alcohol related involvement.

Table 19

Alcohol Related Crashes by County (2000)

County	Alcohol Related				Percent Crashes Alcohol Related
	Fatal Crashes	Total Crashes	Fatalities	Injuries	
Beaverhead	2	31	2	26	14.7%
Big Horn	6	47	8	70	20.7%
Blaine	4	11	7	12	10.6%
Broadwater	0	12	0	11	8.0%
Carbon	2	39	2	30	15.7%
Carter	0	0	0	0	0.0%
Cascade	2	163	2	102	6.2%
Chouteau	1	6	1	10	16.2%
Custer	1	25	1	15	7.7%
Daniels	0	6	0	10	17.6%
Dawson	0	12	0	9	5.3%
Deer Lodge	0	25	0	24	18.4%
Fallon	0	3	0	5	15.8%
Fergus	0	28	0	15	9.4%
Flathead	3	183	3	163	9.6%
Gallatin	5	147	5	107	8.7%
Garfield	0	2	0	1	8.7%
Glacier	6	49	8	76	23.1%
Golden Valley	0	3	0	0	11.5%
Granite	0	12	0	8	9.9%
Hill	0	51	0	57	12.2%
Jefferson	2	31	2	20	8.2%
Judith Basin	0	4	0	2	5.7%
Lake	3	85	3	89	13.4%
Lewis & Clark	2	140	2	96	6.7%
Liberty	1	5	1	4	31.3%
Lincoln	0	44	0	47	13.0%

Table 19 (continued)

Alcohol Related Crashes by County

County	Fatal Crashes	Total Crashes	Fatalities	Injuries	Percent Crashes Alcohol Related
McCone	0	6	0	5	14.3%
Madison	1	16	1	9	11.7%
Meagher	0	7	0	12	18.4%
Mineral	2	22	4	11	7.6%
Missoula	6	269	6	211	11.3%
Musselshell	0	11	0	11	11.3%
Park	1	32	1	22	7.3%
Petroleum	0	0	0	0	0.0%
Phillips	2	15	2	16	15.3%
Pondera	0	11	0	13	13.1%
Powder River	0	3	0	3	6.1%
Powell	5	29	7	31	13.6%
Prairie	0	2	0	1	4.4%
Ravalli	1	67	2	46	8.0%
Richland	1	19	1	8	6.5%
Roosevelt	1	33	1	48	22.8%
Rosebud	0	14	0	18	7.9%
Sanders	2	32	2	22	15.5%
Sheridan	0	9	0	5	11.7%
Silver Bow	3	58	3	47	7.5%
Stillwater	0	34	0	33	12.4%
Sweet Grass	1	13	1	7	10.3%
Teton	1	9	1	8	6.1%
Toole	1	12	1	9	10.2%
Treasure	0	2	0	2	3.8%
Valley	2	17	2	16	10.0%
Wheatland	1	6	1	5	13.6%
Wibaux	0	4	0	2	7.5%
Yellowstone	3	296	3	194	13.6%
Total	74	2211	86	1824	9.9%

Source: TIS -- Montana Department of Transportation

DUI arrest data is not readily available in Montana. Not all arrests result in a conviction for DUI, since some are dismissed or not prosecuted and others are found not guilty. In lieu of arrest data, we now present conviction data, which is gathered by the Department of Justice. Rates per 1000 population and per million vehicle miles traveled are included in Table 20.

Table 20
DUI Convictions

Year	DUI Convictions	Convictions per 1000 Population	Convictions per Million VMT
1991	7800	9.7	0.94
1992	7122	8.7	0.84
1993	6872	8.3	0.80
1994	6097	7.1	0.67
1995	6697	7.7	0.71
1996	6273	7.2	0.67
1997	6217	7.1	0.67
1998	5973	6.8	0.63
1999	6117	6.9	0.63
2000	5787	6.5	0.59
Chg 1 Year	-5.4%	-5.8%	-6.3%
Chg 5 Year	-7.5%	-9.0%	-10.9%

Source: TIS and Traffic Data Collection - Montana Department of Transportation

Data is presented for convictions by county and arresting agency in Table 21. This data is useful for local agencies and task forces in order to track their local efforts. There were 5787 convictions in 2000 compared to 6117 for the previous year. Police departments wrote a total of 2322 convictions, which accounted for 40.1% of the total.

Table 21

Montana DUI Convictions by Arresting Agency – 2000

County	MHP	Sheriff	Police	Total	County	MHP	Sheriff	Police	Total
Beaverhead	17	11	29	57	Meagher	3	2	0	5
Big Horn	26	32	0	58	Mineral	21	39	0	60
Blaine	12	16	11	39	Missoula	169	105	263	537
Broadwater	22	5	0	27	Musselshell	11	11	0	22
Carbon	18	15	47	80	Park	23	42	18	83
Carter	0	0	0	0	Petroleum	0	0	0	0
Cascade	80	121	354	555	Phillips	5	13	0	18
Chouteau	8	7	2	17	Pondera	7	2	3	12
Custer	18	9	41	68	Powder River	4	5	0	9
Daniels	2	2	0	4	Powell	5	27	4	36
Dawson	4	15	31	50	Prairie	3	1	0	4
Deer Lodge	12	61	0	73	Ravalli	32	64	37	133
Fallon	1	1	2	4	Richland	2	15	23	40
Fergus	27	16	25	68	Roosevelt	9	6	6	24
Flathead	101	51	178	330	Rosebud	29	47	0	76
Gallatin	124	107	345	576	Sanders	16	9	12	37
Garfield	1	1	0	2	Sheridan	1	12	0	13
Glacier	62	8	16	183	Silver Bow	45	163	0	208
Golden Valley	1	2	0	3	Stillwater	17	11	13	41
Granite	8	22	0	30	Sweet Grass	15	15	0	30
Hill	32	9	44	85	Teton	6	11	0	17
Jefferson	31	23	9	63	Toole	7	4	0	11
Judith Basin	4	2	0	6	Treasure	2	1	0	3
Lake	57	22	39	195	Valley	12	1	16	29
Lewis & Clark	84	42	228	354	Wheatland	7	8	0	15
Liberty	0	0	0	0	Wibaux	3	3	0	6
Lincoln	20	28	27	75	Yellowstone	234	86	498	818
Madison	13	20	1	34	Unknown	2	270	0	456
McCone	5	3	0	8	Total	1480	1624	2322	5787

Source: Department of Justice

** Totals do not add up because BIA and Unknown Enforcement are not shown

The next table examines "drivers" under age 21 involved in crashes. Those drivers involved in all crashes and in alcohol related crashes are compared. It should be emphasized that the counts are for drivers of age 20 and under (not crashes). It could include a few instances where the young driver had not been drinking, but another older involved driver had been drinking. Fortunately, most alcohol related crashes involve only one vehicle.

Since 1984, when laws were changed, young drivers have responded more to the drinking and driving problem than has the general population. When these young drivers are involved in crashes, 6.2% of the crashes involve alcohol, while the rate is 9.9% for all drivers regardless of age. Table 22 examines the percent of crashes involving alcohol when comparing teenage drivers to adult drivers.

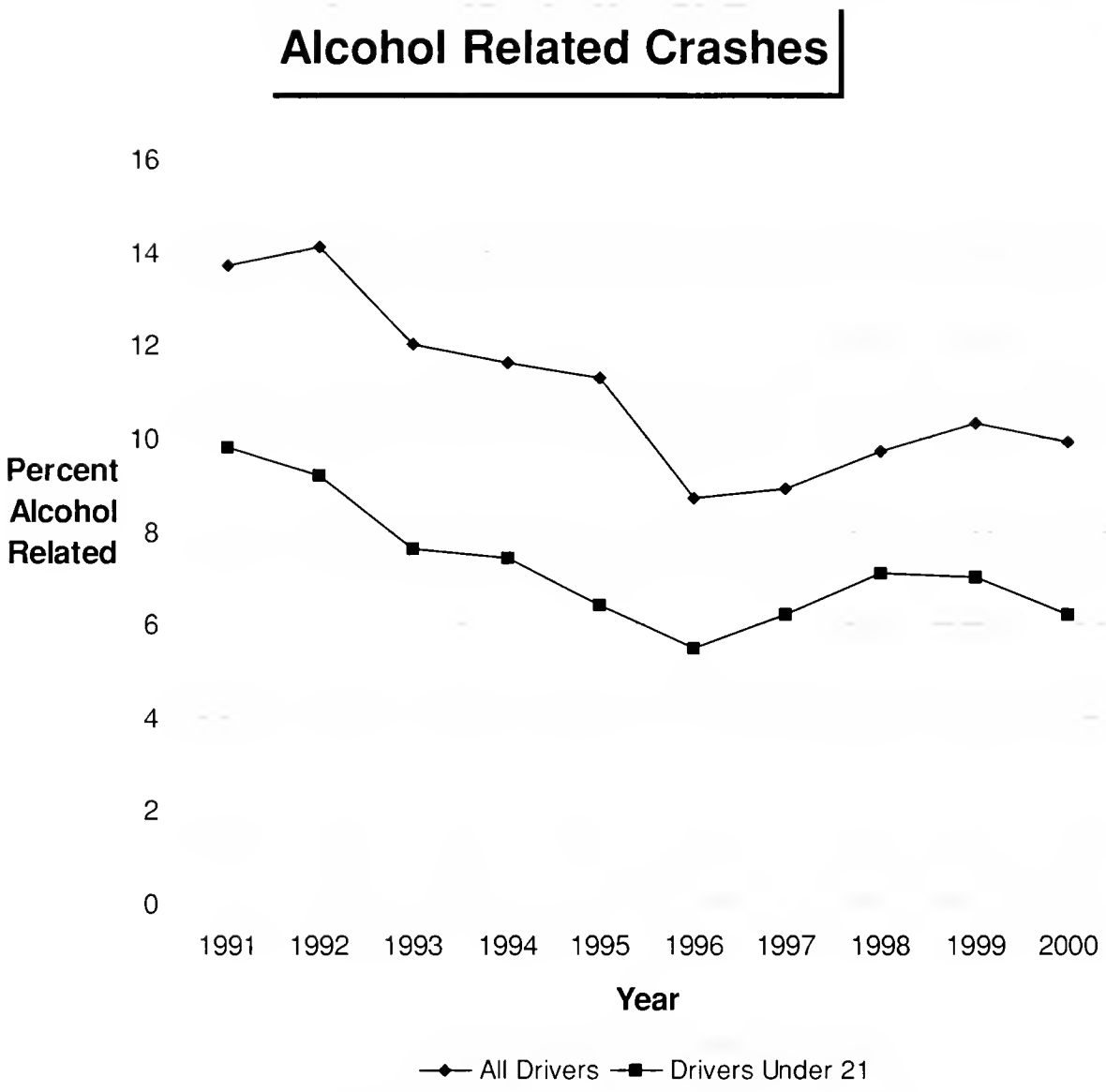
Table 22
Drivers Under 21

Year	Drivers in Fatal Crashes			Drivers In All Crashes		
	Alcohol Related	All	Percent of All	Alcohol Related	All	Percent of All
1991	15	33	45.5%	584	5964	9.8%
1992	14	38	36.8%	580	6319	9.2%
1993	19	45	42.2%	523	6866	7.6%
1994	21	54	38.9%	520	7051	7.4%
1995	14	38	36.8%	492	7672	6.4%
1996	16	46	34.8%	449	8196	5.5%
1997	19	47	40.4%	491	7958	6.2%
1998	14	44	31.8%	534	7503	7.1%
1999	23	55	41.8%	497	7064	7.0%
2000	13	49	26.5%	497	7969	6.2%
Chg 1 Yr	-43.5%	-10.9%	-36.6%	---	+12.8%	-11.4%
Chg 5 Yr	-24.4%	+6.5%	-28.6%	+0.9%	+3.8%	-3.7%

Source: TIS – Montana Department of Transportation

Figure 10 on the following page examines these trends over time. The general decline for percentage of alcohol related crashes up until 1996 is shown. From 1997 until 2000, this percentage has increased slightly.

Figure 10


Alcohol Related Crashes
Percent Alcohol Related
16
14
12
10
8
6
4
2
0
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
All Drivers
Drivers Under 21

2. Occupant Protection

Montana's seat belt law became effective on October 1, 1987, without penalties. Penalties became effective on January 1, 1988. The law was written for secondary enforcement and covered all seating positions within vehicles. When a law is secondary, it means that you cannot specifically stop the vehicle for passengers not wearing restraints. Another reason for making the stop must occur. Sponsors of this bill felt that with the amount of contacts, that law enforcement officers have with the driving public, that this would still give ample opportunity to enforce the law. As it has worked out, Montana is writing more tickets than was expected and more tickets than most states per capita. A bill for standard enforcement has been introduced to the Montana legislature during two sessions and has not been successful.

Montana's restraint usage rates are shown on the next page in Table 23. Rates are determined from an approved NHTSA observational survey. The survey is conducted four times per year at 120 locations. Rates shown in the table are an average of each year's four surveys.

Montana restraint usage increased from 16.8% in 1984 to 33.3% in October 1987 before a mandatory seat belt bill became law. This gain was mostly acquired by conducting seat belt incentive give away campaigns in many of Montana's cities during this period. When the enforcement of the law began, usage jumped to 56% and has gradually increased since that time. The current level of usage is 75.6%. The historical changes in usage for the last ten years appear in the table.

Usage tends to have an annual cycle. Usage is usually two to three percentage points higher in summer than in winter. This cycle is likely caused by a greater percentage of short trips during the winter. Tourists tend be more prevalent in the summer. This tends to increase the percentage of long trips and thereby usage. In addition, families traveling together during the summer tend to have higher usage than when there is just one person in the vehicle.

The interstate, primary, city and other usage rates all increased in 2000. The city category has increased the most during the past year. Future efforts need to emphasize the 'city streets' and 'other roadway' categories. These two road types have high crash rates but lower restraint usage rates, because of a tendency for short trips. Vehicle occupants may think that there is less chance of serious injury on these roads. They may think this since these roads tend to be local and the traveling speed is sometimes slower. Just the opposite is true.

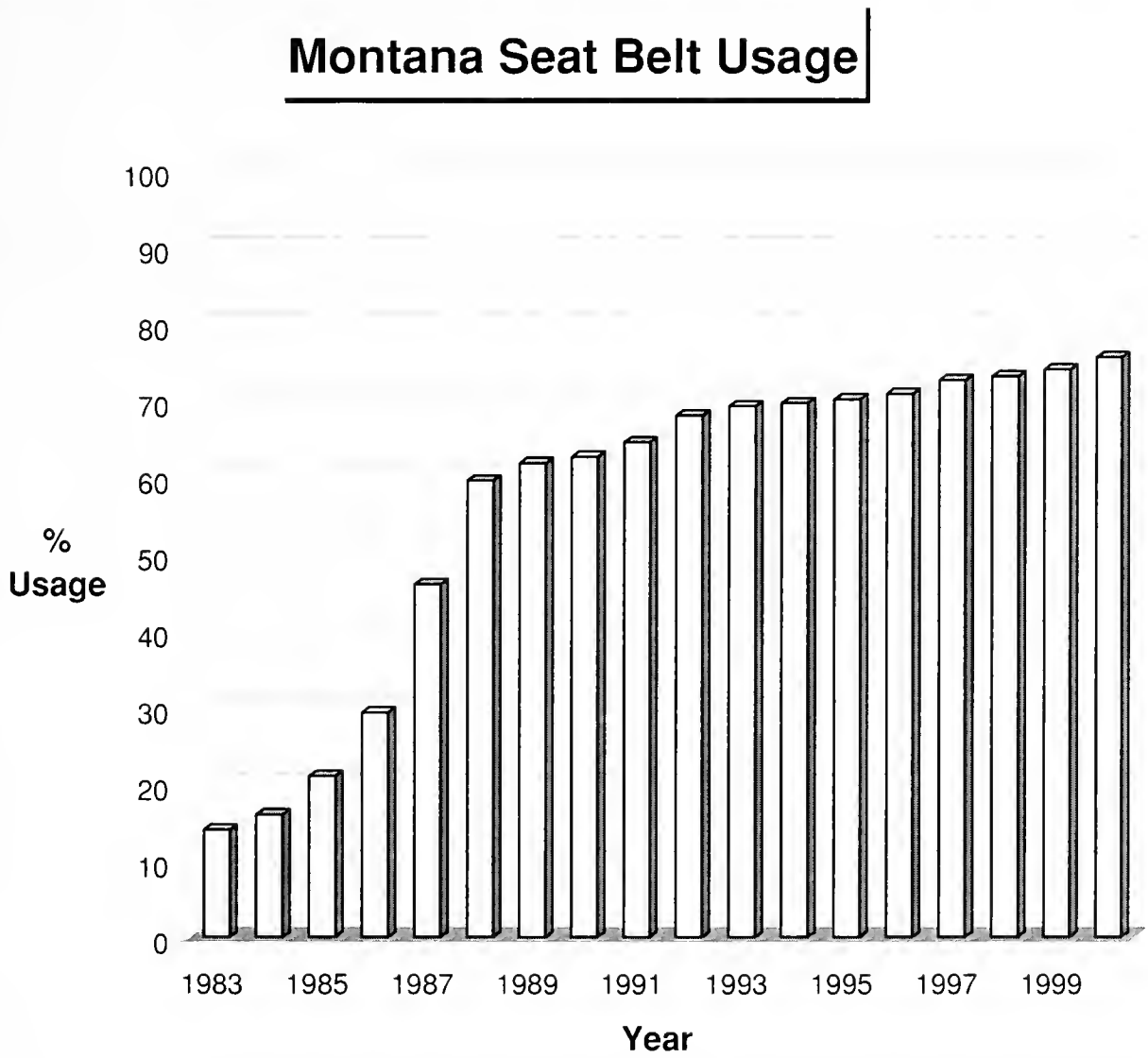
Table 23
Seat Belt Usage Rates

Year	Interstate	Primary	City	Other	All Roads
1991	80.9%	72.8%	41.4%	49.3%	64.5%
1992	83.1%	75.3%	47.8%	53.7%	68.0%
1993	84.2%	75.9%	49.6%	56.2%	69.2%
1994	84.7%	75.4%	51.1%	56.4%	69.6%
1995	86.4%	75.0%	51.3%	57.5%	70.1%
1996	86.2%	75.5%	51.8%	61.0%	70.8%
1997	87.9%	79.3%	52.4%	60.2%	72.6%
1998	88.4%	78.2%	54.0%	63.5%	73.1%
1999	89.1%	78.9%	55.3%	65.0%	74.0%
2000	91.3%	79.5%	58.3%	65.5%	75.6%
Chg 1 Year	+2.5%	+0.8%	+5.4%	+0.8%	+2.2%
Chg 5 Year	+4.2%	+2.7%	+10.1%	+6.6%	+4.8%

Source: TIS – Montana Department of Transportation

On the following page, figure 11 shows a graph of Montana's seat belt usage since 1983.

Figure 11


Montana Seat Belt Usage
100
90
80
70
60
50
40
30
20
10
0
% Usage
1983
1985
1987
1989
1991
1993
1995
1997
1999
Year

The table on the following page shows seat belt convictions by arresting agency. Over 14,500 convictions resulted from seat belt citations issued during 2000. This is lower than the18,300 convictions which resulted from 1999 citations, but that was the highest number of convictions over the thirteen year history of the law. The Montana Highway Patrol writes about 70% of the tickets statewide. Funding for overtime enforcement was provided to the patrol and local law enforcement agencies during the summer to help bring citation numbers up.

Montana restraint usage has been growing steadily, but slowly over the past few years. Police departments account for almost 25% of statewide citations and sheriff departments account for about 5%. Increases in local enforcement may be needed in order to encourage higher usage on local roads and city streets.

The data in Table 24 reflects our continuing need to provide an incentive to local law enforcement in the whole field of traffic safety. The smaller local enforcement agencies, do not usually write significant numbers of seat belt citations. The Bureau of Indian Affairs Police continues to issue very few citations. Seat belt usage on most of Montana's reservations continues to be quite low.

Table 24

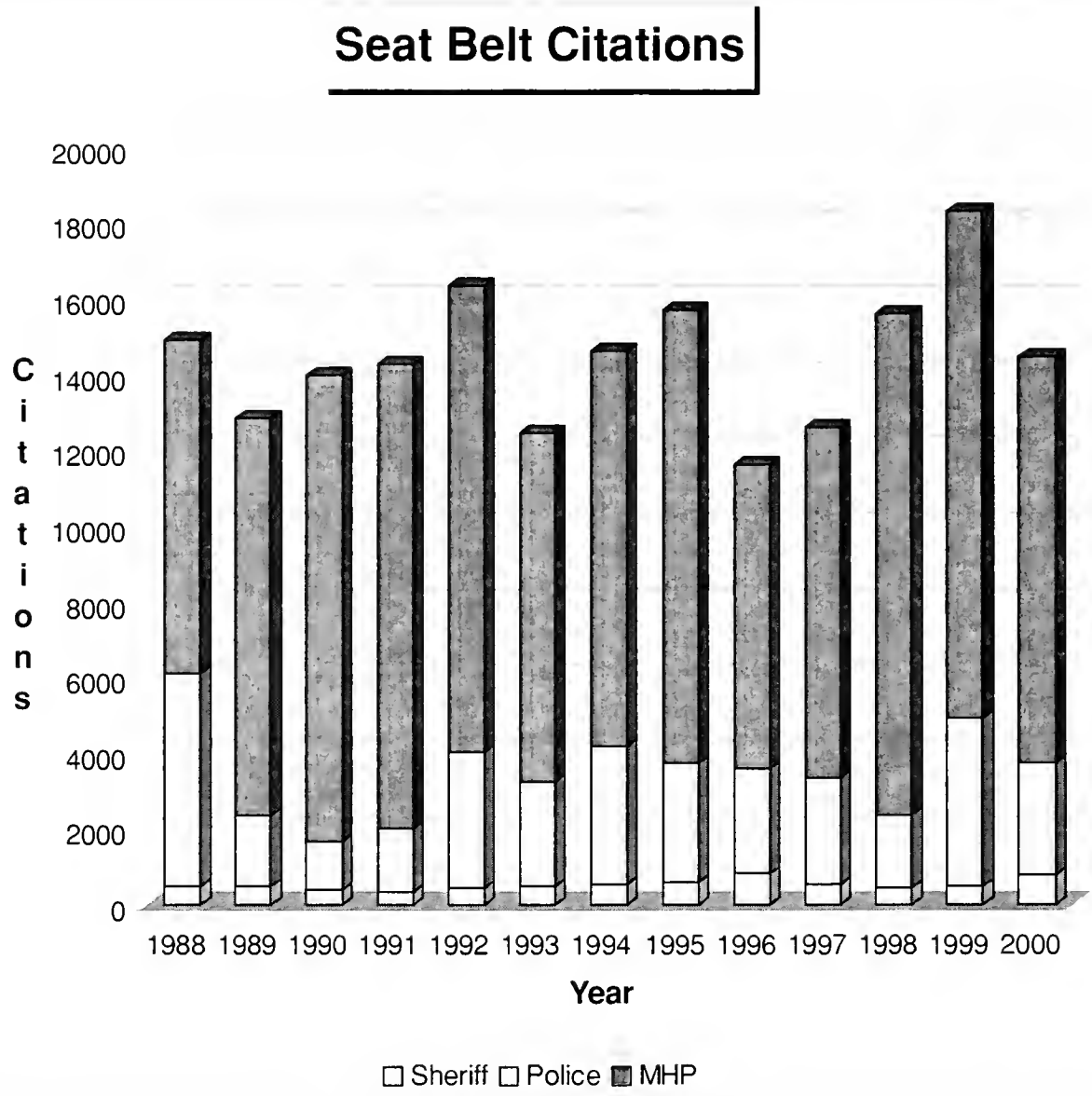
Seat Belt Citation Convictions by Issuing Agency

Year	Police	Sheriff	MHP	BIA	Total
1988	5,612	478	8,818	0	14,908
1989	1,907	483	10,463	0	12,853
1990	1,316	379	12,277	0	13,972
1991	1,658	355	12,267	15	14,295
1992	3,611	453	12,282	62	16,408
1993	2,798	474	9,190	106	12,568
1994	3,654	546	10,437	70	14,707
1995	3,173	585	11,975	38	15,771
1996	2,781	816	8,045	5	11,647
1997	2,792	567	9,272	11	12,642
1998	1,911	459	13,246	75	15,691
1999	4,430	517	13,370	31	18,348
2000	2,960	785	10,752	30	14,527
Chg 1 Year	-33.2%	+51.8%	-19.6%	-3.2%	-20.8%
Chg 5 Year	-1.9%	+33.3%	-3.8%	-6.2%	-2.0%

Source: TIS – Montana Department of Transportation

The number of convictions resulting from citations written by sheriff departments increased significantly during 2000. They wrote 50% more convictions than in 1999. At the same time, the Montana Highway Patrol and Police Departments wrote fewer citations, which resulted in convictions than during 1999. Figure 12 on the next page shows tickets written during the thirteen years of the law.

Figure 12


Seat Belt Citations
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Citations
1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000
Year
Sheriff Police MHP

Injuries and fatalities to occupants ages four and under are of interest in relation to child safety and child restraint usage. The following table shows the history of injury data over the last twenty-three years. Injuries have increased over the last eight years, but decreased in 2000. During the early 1970's, the fatalities for this age group were usually between ten and fifteen. When child restraints became more common, these numbers dropped. Rental programs and publicity during the eighties helped reduce injuries to a level of 154 in 1991. Injury numbers have generally increased since. Changes in the crash reporting form in 1996 may have resulted in more complete reporting of children as occupants and their restraint usage, thus causing part of this increase.

Table 25
Occupant Injuries – Age Four and Under

Year	Fatalities	Injuries
1978	4	235
1979	5	221
1980	4	199
1981	2	244
1982	3	220
1983	3	215
1984	1	198
1985	2	178
1986	5	161
1987	4	196
1988	5	164
1989	5	174
1990	2	159
1991	4	154
1992	3	160
1993	0	166
1994	6	188
1995	3	170
1996	6	209
1997	6	228
1998	3	283
1999	1	288
2000	4	249
Change 1 Year	+300%	-13.5%
Change 5 Year	+5.3%	+5.7%

Source: Montana Department of Transportation

3. Driver's Hazardous Actions and License Compliance

a. Speed and Hazardous Driver Actions

When the national speed limit was rescinded December 8, 1995, Montana no longer had a specific daytime speed limit. The Montana "basic rule" law required that vehicles be driven "... in a careful and prudent manner and at a rate of speed no greater than is reasonable and proper under the conditions existing at the point of operation...". The Montana Supreme Court declared this law unconstitutional during late 1998. At that time, there was truly no control of speed in Montana, except for the "careless driving" statute.

The 1999 legislature passed a speed limit bill that became law on Memorial Day weekend of 1999. The limit on the interstate for passenger vehicles is 75, while the other non-interstate routes have a speed limit of 70 mile per hour limit. Night speeds are 75 on the interstate and 65 on non-interstate routes. Trucks have limits that are somewhat slower. These changes in speed limits may have some impact on traffic safety in Montana. It will take some time for the numbers to be large enough in order to analyze the data with any statistical certainty. Unfortunately, the law inadvertently placed a 70 mile per hour limit on county roads unless they have a specifically lower set limit.

Certainly the new limit will help solve the issue of out-of-state drivers. Drivers from out-of-state drove significantly faster than Montanans. This may have had much to do with the fact that these drivers simply did not understand the basic rule law. Montanans, through experience, did understand that there was a speed limit which just didn't have a specific number attached.

Characteristics recorded about the driver and his or her actions leading up to crashes are now examined. Hazardous actions in crashes as determined by the investigating officer are summarized in Table 26. Careless Driving has been increasing steadily over the last few years. During 1996, crash investigators felt that careless driving was one of the contributors to the crash in just over 3,900 instances. In 2000, this was felt to be a contributor in over 5,900 instances. Each year over this period has shown an increase. This is perhaps an area that needs to be watched closely. The other contributors listed in Table 26 do not seem to be showing a significant trend.

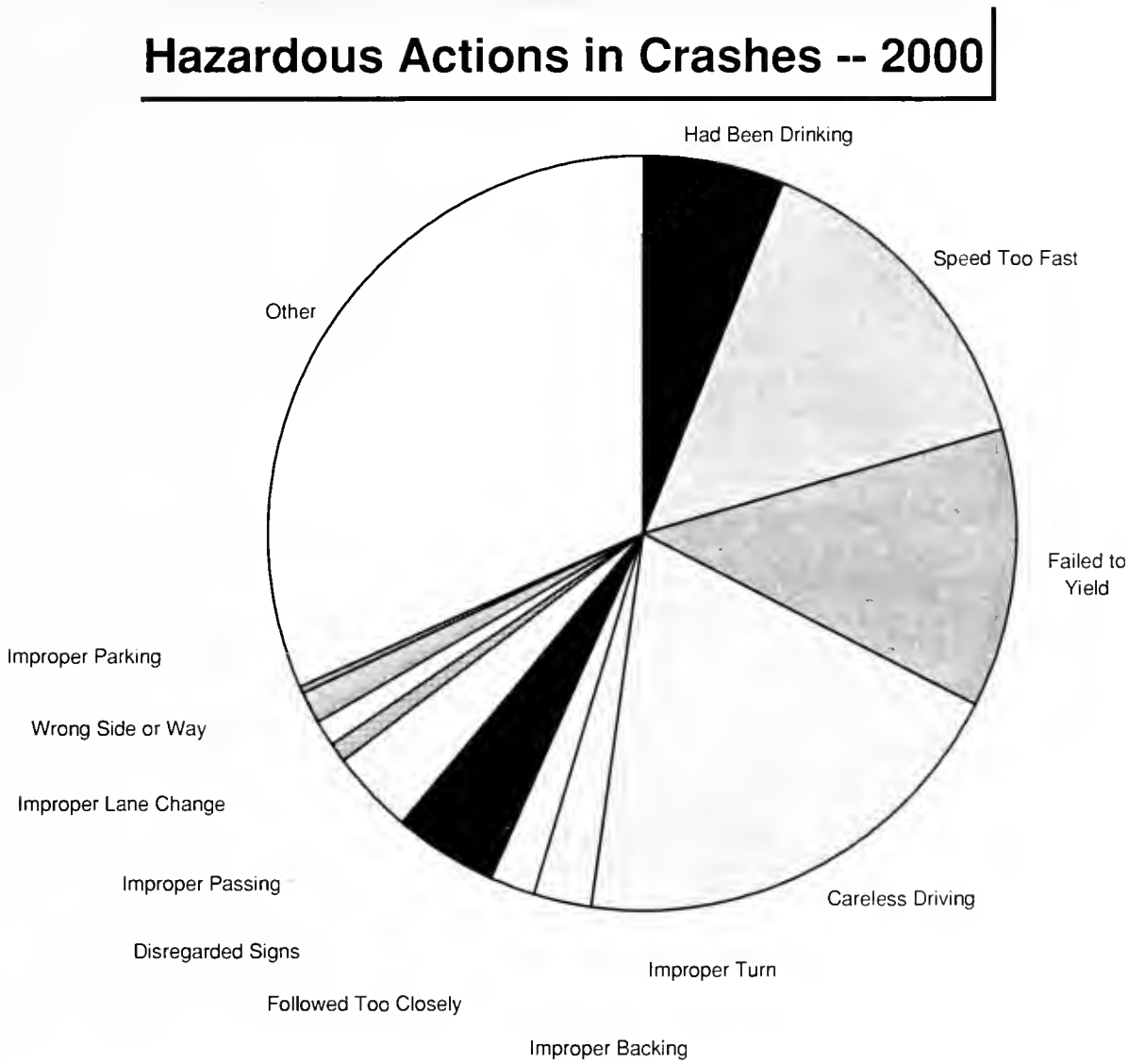
Table 26
Hazardous Actions in Crashes

Year	Alcohol	Speed Too Fast	Failed to Yield	Careless Driving	Improper Turn	Improper Backing
1991	1436	2620	3125	3264	461	393
1992	1529	2266	3385	3397	503	435
1993	1422	2890	3832	3503	514	471
1994	1382	2883	3664	3813	530	487
1995	1532	2887	3902	4133	531	493
1996	1948	6146	4480	3924	893	797
1997	1791	4806	4040	4313	865	710
1998	1816	4462	3687	4645	753	718
1999	1851	3335	3483	5492	713	633
2000	1818	4396	3627	5928	742	629
Chg 1 Yr	-1.8%	+31.8%	+4.1%	+7.9%	+4.1%	-0.6%
Chg 5 Yr	+1.7%	+1.6%	-7.4%	+31.7%	-1.2%	-6.1%

Source: TIS – Montana Department of Transportation

The change to no daytime numerical speed limit in late 1995 along with a new crash reporting form has affected the category of hazardous actions. Speed too fast for conditions took a jump in 1996. The new form contained some new codes, which may have had an effect on the numbers. A speed limit became effective at the beginning of the Memorial Day weekend in 1999. Figure 13 on the following page shows a percentage breakout for driver's hazardous actions in crashes for 2000.

Figure 13


Hazardous Actions in Crashes -- 2000
Had Been Drinking
Speed Too Fast
Other
Failed to Yield
Improper Parking
Wrong Side or Way
Improper Lane Change
Improper Passing
Careless Driving
Disregarded Signs
Improper Turn
Followed Too Closely
Improper Backing

b. Driver's License Compliance:

The next table examines the license status of each driver at the time of involvement in a traffic crash. Only the most common status codes are included in the table.

Table 27
License Status for Drivers in Crashes

Year	Valid License	No License	Proba-tionary	Expired	Suspended	Revoked
1991	24,460	1,120	153	275	196	249
1992	25,004	1,156	147	270	214	231
1993	28,116	887	188	293	227	255
1994	28,301	1,002	149	299	237	277
1995	30,016	950	163	309	238	295
1996	35,953	700	181	348	275	342
1997	32,366	702	164	367	416	222
1998	29,948	658	145	389	410	240
1999	28,810	654	173	382	501	265
2000	30,971	651	181	245	536	239
Chg 1 Yr	+7.5%	-0.5%	+4.6%	-35.9%	+7.0%	-9.8%
Chg 5 Yr	-1.4%	-11.2%	+9.6%	-31.8%	+45.7%	-12.4%

Source: TIS – Montana Department of Transportation

The number of drivers involved in crashes while driving with suspended licenses continues to increase. This may mean that we are doing a better job at suspending licenses after DUI convictions, although many of these drivers are still driving. At the same time those driving with no license have been decreasing slowly over the last ten years.

4. Traffic Records

Traffic safety data and specifically crash data are an important part of any highway safety program. Without timely and relevant data, a traffic safety program cannot efficiently operate. The current crash system and reporting form were developed during 1994 and 1995. This system replaced Montana's Highway Information System (HIS) on January 1, 1996. The new system is part of the overall Transportation Information System (TIS) supported by the Montana Department of Transportation. Included with this new system is an on line road log, traffic counts, a GIS database which contains a photo log of all on system roads in the state.

Computers have been showing up in enforcement vehicles over the last several years. Several local law enforcement jurisdictions currently have laptops mounted in their cars. Traffic Safety contracted with the Highway Patrol to develop a software system for input of crash data of reportable crashes at the scene. Quest Inc. was subcontracted to develop the system. This software was completed and is being used by all Highway Patrolmen and a large percentage of officers in Police and Sheriff Departments. It is used on either in-car computers or computers within the office. Currently, most forms are being completed in the office and transmitted to Highway Patrol headquarters to be added to the database. Over time more of this information will be coded on in-car computers.

The system is being made available to all Montana jurisdictions, free of charge, to use for crash reporting. Quest Inc. has been contracted to provide an interface for coding location input from GPS units. Quest and the Department of Transportation are working to finish this project to allow entry of location codes by GPS. Then the department will relate those locations onto X-Y coordinates and attach the crashes to the road system. At that time the traffic safety unit will proceed more directly with encouraging computers in enforcement vehicles.

We have been researching other state systems in order to find what ideas we could use from other states. Some of the software developed in Iowa may have potential in Montana. In addition, CARE developed in Alabama for the analysis of crash data may have potential for use in Montana.

5. Emergency Medical Services

Emergency Medical Services differs from many program areas in Traffic Safety because there is no intention of affecting the number of crashes. Theoretically, better EMS will reduce the number of fatalities and complications from severe injuries. Table 28 lists the total number of crashes involving either fatalities or incapacitating injuries by county. This provides a basis for approximating the need of EMS as related to traffic crashes by area.

Table 28
Severe Injury Crashes by County – 2000

County	Severe Crashes	County	Severe Crashes
Beaverhead	20	Madison	10
Big Horn	32	Meagher	9
Blaine	10	Mineral	16
Broadwater	15	Missoula	217
Carbon	29	Musselshell	10
Carter	2	Park	25
Cascade	75	Petroleum	1
Chouteau	6	Phillips	13
Custer	13	Pondera	10
Daniels	7	Powder River	3
Dawson	9	Powell	29
Deer Lodge	21	Prairie	3
Fallon	3	Ravalli	59
Fergus	16	Richland	13
Flathead	135	Roosevelt	16
Gallatin	81	Rosebud	14
Garfield	0	Sanders	16
Glacier	33	Sheridan	2
Golden Valley	2	Silver Bow	37
Granite	15	Stillwater	27
Hill	22	Sweet Grass	11
Jefferson	36	Teton	16
Judith Basin	6	Toole	12
Lake	53	Treasure	2
Lewis and Clark	77	Valley	7
Liberty	3	Wheatland	3
Lincoln	43	Wibaux	3
McCone	5	Yellowstone	146

Source: TIS – Montana Department of Transportation

The county with the most severe crashes in Montana was Missoula with 217. Yellowstone was next with 146, and Flathead right behind with 135. Following, these three counties, there is a significant drop in numbers to Gallatin, Lewis and Clark, Cascade, Ravalli, Lake and Lincoln.

No computerized data currently exists which tracks response times of ambulances, or other data related to care given. It becomes difficult to improve the system without this type of information. The EMS Bureau and related agencies, such as hospitals and ambulance services have over the last few years been examining the potential for designing a pre-hospital data system.

Computers exist in most of the ambulance services in the state. The services use these computers for training. In addition, the computers will be used for ambulance trip report data if that software becomes available. Some of this data will be transferred to the state EMS Bureau for statewide informational purposes.

6. Motorcycle Involvement in Crashes

Motorcyclists in traffic crashes comprise a relatively small percentage of all persons involved in crashes. However, these persons are at much greater risk when involved in a crash. Because of this, motorcycles account for a significant amount of fatalities and serious injuries. Table 29 shows the number of motorcycle crashes, the fatal crashes and the injury crashes over the past ten years.

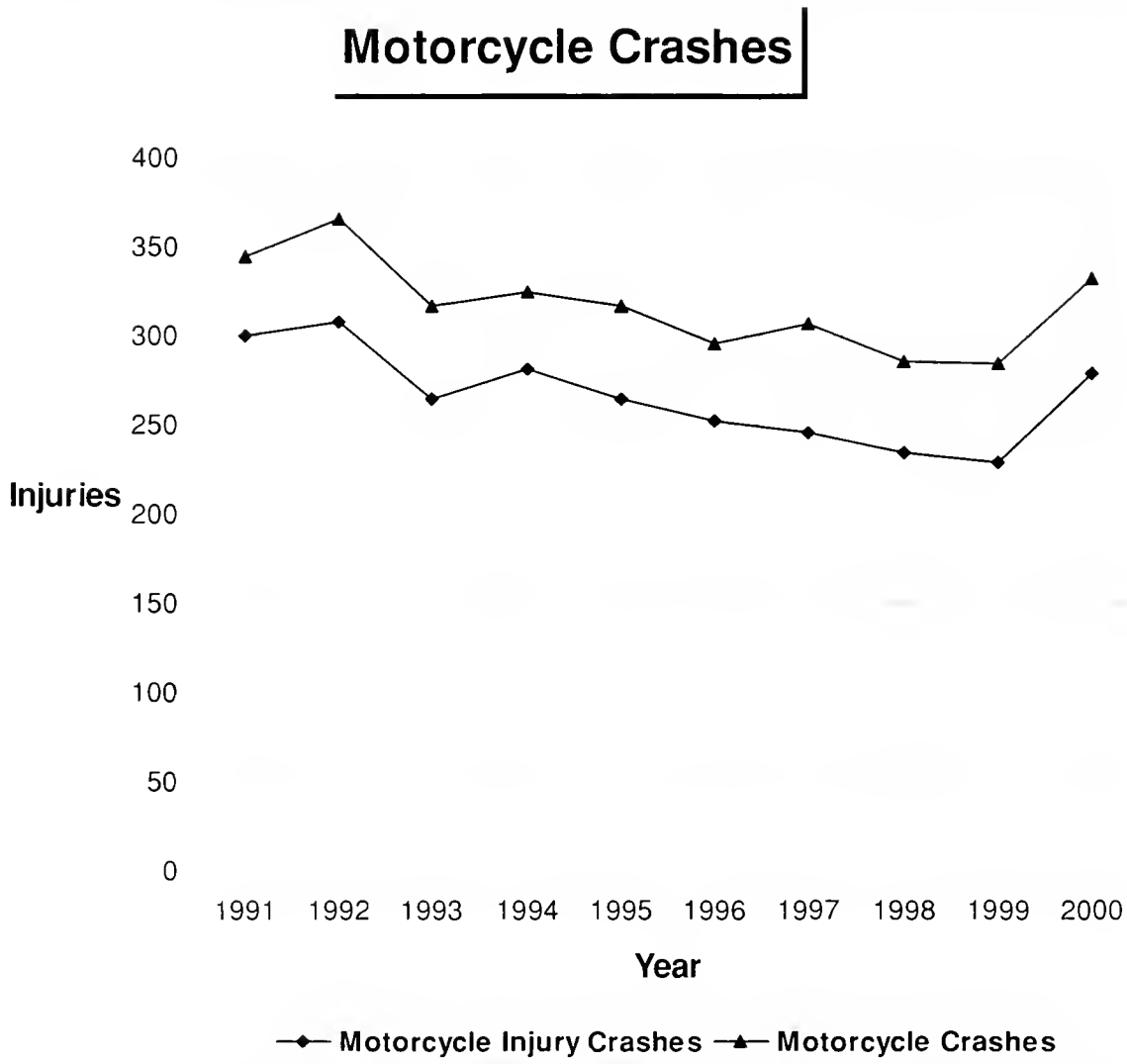
Table 29
Motorcycle Crashes

Year	Crashes	Percent of All Crashes	Fatal Crashes	Percent of all Fatal Crashes	Injury Crashes
1991	344	2.0%	10	5.8%	300
1992	366	2.3%	12	7.1%	308
1993	317	1.7%	17	10.2%	265
1994	324	1.7%	13	7.1%	281
1995	317	1.5%	14	7.5%	265
1996	296	1.2%	8	4.5%	252
1997	307	1.4%	18	8.1%	246
1998	286	1.3%	13	6.3%	235
1999	284	1.3%	15	7.7%	229
2000	332	1.5%	14	7.0%	279
Chg 1 Year	+16.9%	+15.4%	-6.7%	-9.1%	+21.8%
Chg 5 Year	+11.4%	+11.9%	+2.9%	+2.6%	+13.7%

Source: TIS – Montana Department of Transportation

Motorcycle crashes and injury crashes have been decreasing in recent years, but that trend changed in 2000. There were 48 more crashes in 2000, which accounted for 1.5% of all crashes. Motorcycle fatality crashes accounted for 7.0% of all fatal crashes, which was down somewhat in 2000. These crashes resulted in 14 fatalities of which only 13 were to the motorcyclists and there were 323 injuries. Figure 14 on the following page shows the trend in motorcycle crashes and injuries.

Figure 14


Motorcycle Crashes
400
350
300
250
200
150
100
50
0
Injuries
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Motorcycle Injury Crashes
Motorcycle Crashes

The next table shows helmet usage for drivers and passengers in motorcycle crashes. Usage was quite low for all ages. Those over 65 wore helmets much more often than the other age groups. Most other age groups wore their helmets between 40 and 45 percent with the exception of 18-19 year olds who wore helmets about 30 percent of the time.

Table 30
Motorcycle Helmet Use by Age
(2000 Crash Data)

Age	Driver		Passenger	
	Used	Not Used	Used	Not Used
14 & Under	2	2	2	1
15-17	5	6	1	2
18-19	11	14	0	1
20-24	15	33	1	8
25-34	22	30	2	5
35-64	68	104	21	17
65 & Over	9	3	0	0
Not Stated	0	8	0	0
Total	132	200	27	34

Source: TIS - Montana Department of Transportation

The observational helmet use survey shows a relatively low usage of helmets in cities and on local roads. Helmet use is only 34% in the cities, while it is 74% on primary roads. The overall statewide usage rate is 59% based upon a sample size of only 177 observations.

The next table compares motorcycle injury severity with injury severity in crashes for all vehicles. Although it is obvious that motorcycle crashes will result in much higher severity of injuries, it is worth the effort to show just how much at risk are these individuals. The data in Table 31 shows that severe injuries and fatalities occur in a much higher percentage of motorcycle crashes than in all crashes.

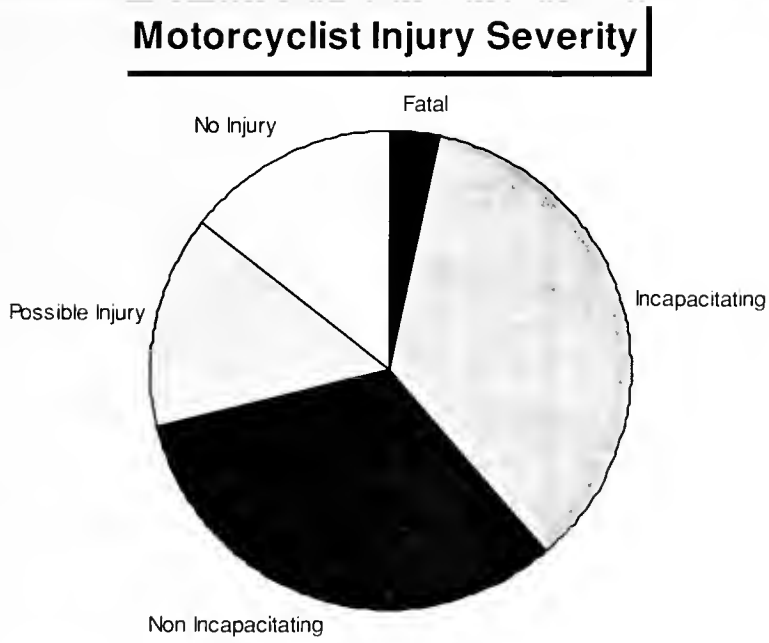
Table 31
Motorcyclist Injury Severity Comparison – 2000

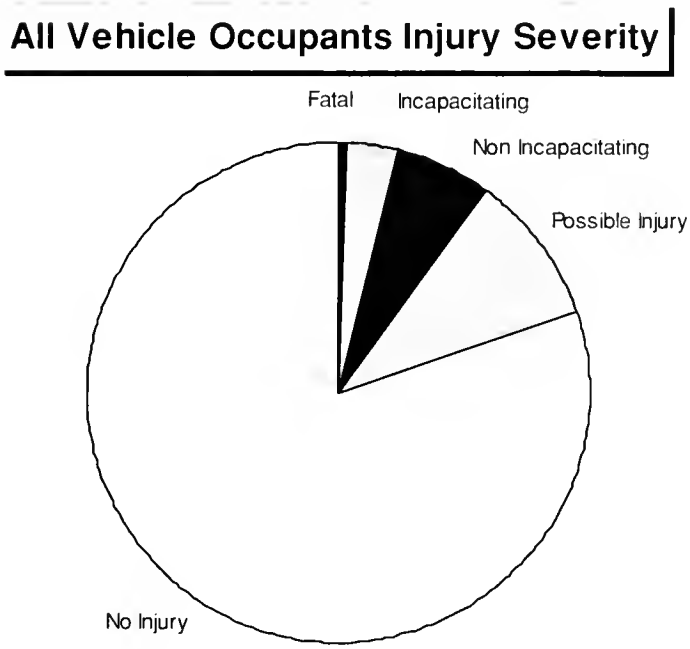
Injury Severity	Crashes Involving Motorcycles		All Crashes	
	Injuries	Percentage	Injuries	Percentage
Fatalities	13	3.3%	237	0.4%
Incapacitating Injury	139	35.5%	1,790	3.3%
Non Incapacitating	127	32.4%	3,325	6.2%
Possible	57	14.4%	5,149	9.6%
No Injury	57	14.4%	43,029	80.4%
Total People	392	---	53,530	---

Source: TIS - Montana Department of Transportation

An interpretation of this data indicates that the risk of fatality or severe injury for a motorcyclist in a crash is very high. Motorcycle drivers and passengers who are killed or incapacitated account for 38.8% of all riders in crashes. By comparison 3.7% of drivers and passengers in all motor vehicle crashes receive fatal or incapacitating injuries. The chance of severe injury is more than ten times higher when riding motorcycles. For a graphical representation, see the pie charts in figure 15 on the following page.

Figure 15


Motorcyclist Injury Severity
Fatal
No Injury
Incapacitating
Possible Injury
Non Incapacitating


All Vehicle Occupants Injury Severity
Fatal
Incapacitating
Non Incapacitating
Possible Injury
No Injury

In the next table, we examine the age of motorcycle fatality victims. Most fatalities in the past occurred in the 20-34 year age group. However, in recent years there has been a shift occurring with most fatalities coming from the 35 - 64 age group.

Table 32
Motorcycle Fatalities by Age

Year	Age Groups							
	0-14	15-17	18-19	20-24	25-34	35-64	65+	Total
1991	0	0	0	5	5	0	0	10
1992	0	2	0	1	4	6	0	13
1993	0	0	3	6	3	9	0	21
1994	0	0	2	0	3	8	0	13
1995	0	0	1	1	4	10	0	16
1996	0	0	2	2	1	4	0	9
1997	0	1	2	2	4	11	0	20
1998	0	0	1	0	3	8	2	14
1999	0	0	0	2	3	10	0	15
2000	0	0	0	3	1	8	1	13
10 Yr Total	0	3	11	22	31	74	3	144

Source: TIS – Montana Department of Transportation

Motorcyclist deaths continue to be a problem in the state. Severe injuries have a large impact because of the cost to the public and private sectors. Data from the state's trauma registry and CODES project should help pinpoint the costs associated with these injuries and provide additional information.

7. Collisions with Pedestrians

A general summary of pedestrian collisions is shown below in Table 33. The number of these collisions has been showing no specific trend during the 1990's. It should be noted that pedestrian collisions as a percent of all crashes are continuing to drop having reached a low of only 0.7%. Fatal crashes have been slowly declining during the last 20 years, and are well below numbers during the 1970's. These crashes account for 5.5% of all fatal crashes. Fatalities during 1997 and 1999 were two of the lowest years for some time.

Table 33
Motor Vehicle Collisions with Pedestrians

Year	Crashes	% of All Crashes	Fatal Crashes	% of all Fatal Crashes	Fatalities	Injury Crashes	Injuries
1991	146	0.9%	12	7.0%	12	147	182
1992	161	0.9%	12	7.0%	12	151	160
1993	160	0.8%	11	6.6%	11	156	170
1994	169	0.9%	11	6.0%	11	155	170
1995	185	0.9%	12	6.5%	12	171	196
1996	180	0.7%	13	7.3%	13	149	178
1997	167	0.7%	9	4.0%	9	136	146
1998	166	0.8%	13	6.3%	13	135	148
1999	153	0.7%	7	3.1%	7	128	145
2000	161	0.7%	11	5.5%	11	139	148
Chg 1 Year	+5.2%	---	+57.1%	+77.4%	+57.1%	-8.6%	+2.1%
Chg 5 Year	-5.4%	-7.9%	+1.9%	+1.1%	+1.9%	-3.3%	-9.0%

Source: TIS – Montana Department of Transportation

Table 34 lists the pedestrian injuries plus fatalities by age of casualty. Casualties tend to be spread among all ages, but there is some concentration of injuries from ages 5 to 24. Injuries from pedestrians makes up a small percentage of total injuries in the state, but the number of pedestrian fatalities still makes up a significant amount of the total number of fatalities.

Table 34
Pedestrian Casualties by Age

Year	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1991	14	51	33	21	18	9	9	15	175
1992	11	43	33	24	19	8	10	16	171
1993	10	46	31	21	23	12	10	15	173
1994	9	44	37	24	20	15	4	15	176
1995	11	58	37	17	18	17	7	23	193
1996	3	38	30	28	23	15	7	27	171
1997	8	32	33	11	20	13	13	19	149
1998	2	28	38	13	24	17	10	20	152
1999	4	28	17	7	11	14	8	48	151
2000	5	41	27	18	20	20	11	17	159
10 Yr Total	77	409	316	184	196	140	89	215	1670

Note: The totals for each year may not equal the total because of a small amount of cases where no age was noted on the accident report.

Source: TIS – Montana Department of Transportation

Table 35 shows a summary of actions of the pedestrian during and before the time of the collision. Coding changes to the categories on the new crash reporting form beginning in 1996 may affect the numbers in some categories.

Table 35
Pedestrian Injuries by Action

Year	At Intersection or Crosswalk	Not at Intersection or Crosswalk	Walking or Standing In Road	Working on or Pushing Vehicle	Playing or darting into Roadway	Other
1991	83	43	16	9	2	22
1992	83	35	15	4	4	33
1993	70	44	15	3	6	35
1994	80	41	20	3	4	28
1995	93	42	19	5	9	24
1996	47	32	24	6	25	37
1997	35	24	29	5	24	32
1998	56	18	28	7	19	25
1999	60	12	13	3	26	23
2000	57	17	20	6	32	26
Chg 1 Yr	-5.0%	+41.7%	+53.8%	+100.0%	+23.1%	+13.0%
Chg 5 Yr	-2.1%	-33.6%	-11.5%	+15.4%	+60.0%	-7.8%

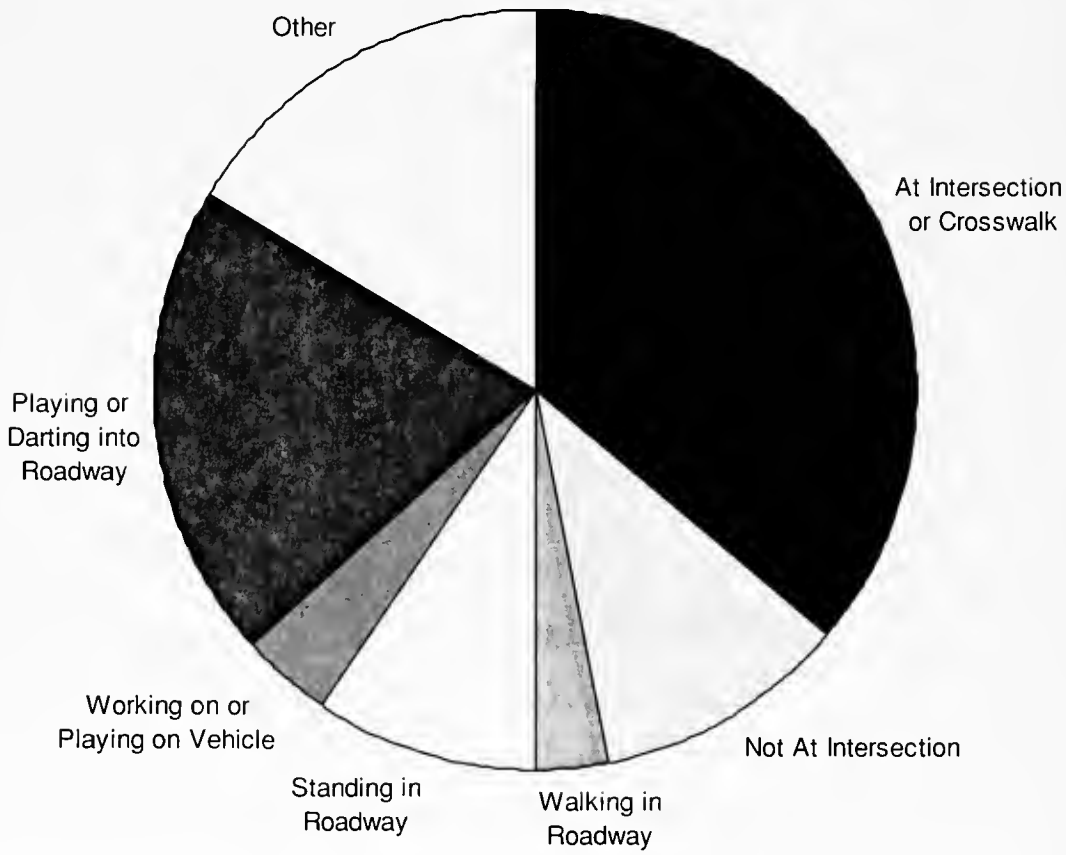
Source: TIS – Montana Department of Transportation

* The data from 1996-2000 does not compare well with data before 1996 because of change in accident reporting form

Figure 16 on the following page shows a pie chart for all pedestrian collisions by action during 2000.

Figure 16

Pedestrian Action in Crashes -- 2000



8. Collisions with Bicyclists

Bicycle crashes with motor vehicles, as a percentage of total motor vehicle crashes, reached a low in 1996. The year 2000 resulted in a large number of fatal crashes involving a bicyclist. This was thought to be a statistical aberration, but fatalities should be examined closely in future years.

Table 36
Motor Vehicle Collisions with Bicyclists

Year	Crashes	Percent of All Crashes	Fatalities	Percent of all Fatalities	Injuries
1991	146	0.86%	1	0.50%	151
1992	180	1.04%	5	2.94%	180
1993	149	0.79%	1	0.60%	155
1994	208	1.07%	2	1.10%	203
1995	197	0.96%	1	0.47%	203
1996	180	0.74%	2	1.13%	158
1997	224	0.99%	1	0.38%	202
1998	198	0.90%	1	0.42%	183
1999	178	0.84%	3	1.36%	183
2000	200	0.90%	8	3.40%	177
Chg 1 Year	+12.4%	+7.1%	+167%	+150%	-3.3%
Chg 5 Year	+2.4%	+1.6%	+400%	+352%	-4.7%

Source: TIS – Montana Department of Transportation

Table 37 presents bicyclist injuries including fatalities by age of the casualty. Bicyclist injuries tend to be concentrated in the ages from 5 to 19. The 10-14 year old age group remains the highest casualty group. In recent years, there are increasing numbers of injuries in the higher age groups. Total bicycle injuries were nearly the same as in the previous two years.

Table 37
Bicyclist Casualties by Age

Year	0-9	10-14	15-19	20-24	25-34	35-54	55+	Total
1991	38	47	24	15	13	14	2	153
1992	31	61	21	15	19	24	10	184
1993	37	49	15	17	19	15	1	158
1994	45	59	34	16	23	18	4	204
1995	41	67	30	19	20	23	4	204
1996	29	48	25	17	17	21	2	160
1997	38	62	33	19	19	24	6	202
1998	28	50	14	18	28	33	12	184
1999	28	36	23	14	13	26	27	186
2000	30	46	27	18	23	30	11	185
10 Yr Total	345	525	246	168	194	228	79	1820

Note: The totals for each year may not equal the total because of a small amount of cases where no age was noted on the accident report.

Source: TIS – Montana Department of Transportation

9. Truck Involvement In Crashes

This section examines crashes involving trucks in Montana. The following table contains a ten-year history of truck crashes within the state. The number of crashes reached a high in 1996 and has decreased by 15% over the last four years. The number of fatal crashes resulting from truck involvement was significantly higher in 2000 than in the previous two years. This change will be watched closely in order to decide if there is a new trend occurring.

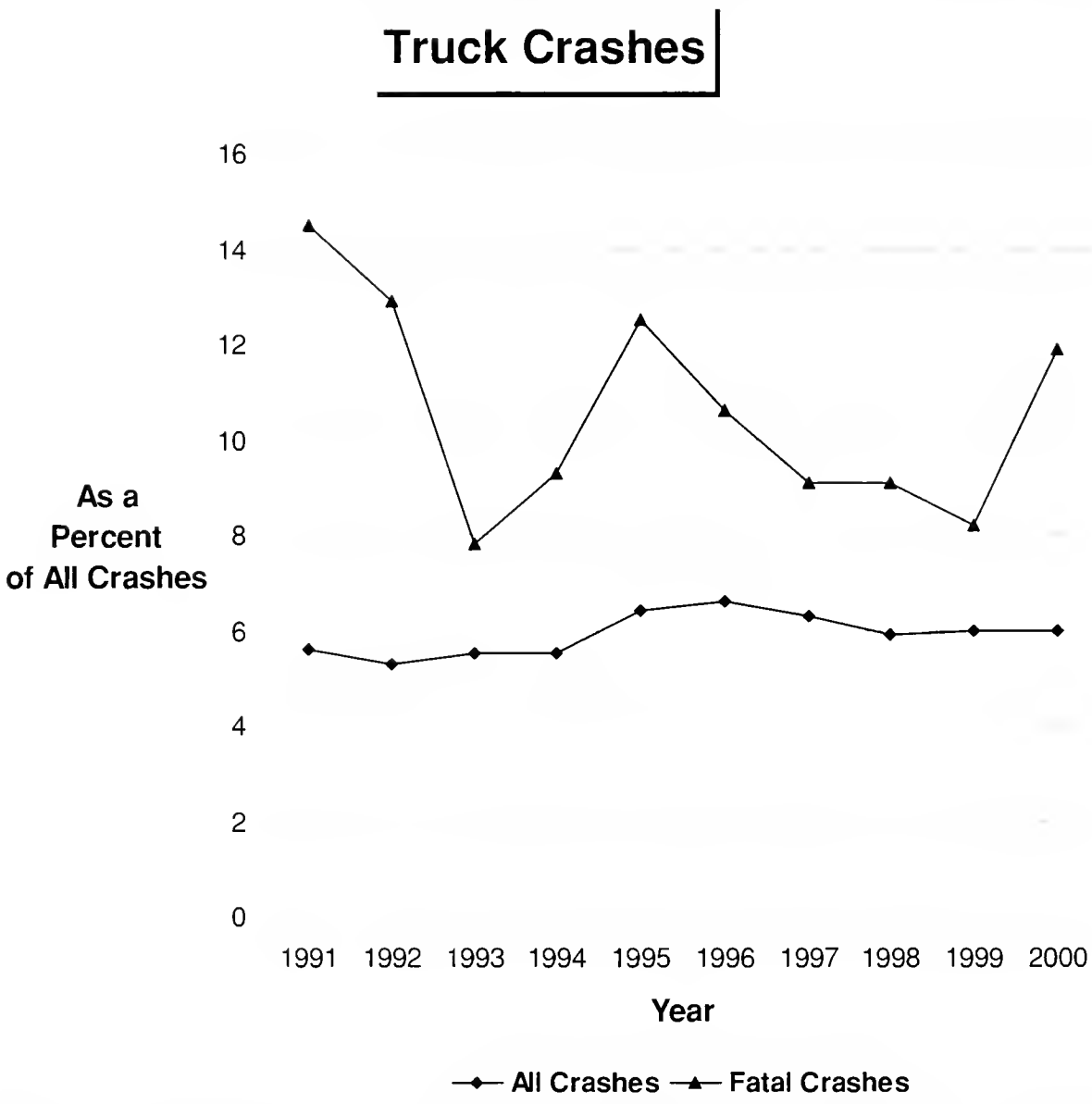
Table 38
Number of Crashes Involving Trucks

Year	Crashes		Fatal Crashes	
	Number	Percent of all Crashes	Number	Percent of all Fatal Crashes
1991	959	5.6%	25	14.5%
1992	923	5.3%	22	12.9%
1993	1043	5.5%	13	7.8%
1994	1056	5.5%	17	9.3%
1995	1314	6.4%	27	12.5%
1996	1646	6.6%	21	10.6%
1997	1426	6.3%	24	9.1%
1998	1310	5.9%	19	9.1%
1999	1262	6.0%	16	8.2%
2000	1346	6.0%	24	11.9%
Chg 1 Year	+6.7%	---	+50.0%	+45.1%
Chg 5 Year	-3.3%	-3.8%	+12.1%	+20.2%

Source: TIS - Montana Department of Transportation

Figure 17 on the following page shows the number of truck crashes as a percentage of all motor vehicle crashes and fatal truck crashes as a percentage of all motor vehicle fatal crashes.

Figure 17


Truck Crashes
16
14
12
10
8
6
4
2
0
As a Percent of All Crashes
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
All Crashes
Fatal Crashes

This table presents a breakout of trucks by trailer type. There seems to be no significant trends in the number of double and triple trailer crashes. There were some high numbers in 1996, which were likely caused by abnormally icy roads.

Table 39
Truck Crashes by Trailer Type

	Crashes				Fatal Crashes			
Year	No Trailer *	Single Trailer	Double Trailer	Triple Trailer	No Trailer	Single Trailer	Double Trailer	Triple Trailer
1991	388	483	83	5	9	13	3	0
1992	354	476	91	2	5	10	7	0
1993	453	501	87	2	2	10	1	0
1994	415	549	92	3	4	11	2	0
1995	625	579	109	1	8	13	6	0
1996	619	864	161	2	0	12	1	0
1997	533	783	107	3	6	15	3	0
1998	517	663	129	1	8	9	2	0
1999	518	658	123	1	5	8	3	0
2000	524	760	111	2	10	14	0	0
Chg 1 Yr	+1.2%	+15.5%	-9.8%	+100%	+100%	+75.0%	-100%	---
Chg 5 Yr	-6.8%	+7.1%	-11.8%	+25.0%	-14.8%	+22.8%	-100%	---

Source: TIS – Montana Department of Transportation

* Trucks with no trailer would include single unit vehicles like delivery trucks and local UPS trucks. They could also include Tractor-Trucks that currently are not pulling a trailer.

10. Unusual Vehicle Involvement In Crashes

This Section displays data for unusual vehicles such as buses, ambulances, farm machinery and fire trucks. Table 40 contains data on the number of these unusual vehicles involved in crashes for a ten-year period.

Table 40
Unusual Vehicle Types in Crashes

Year	School Bus	Bus	Ambulance	Farm Machinery	Fire Truck	Snow-mobile
1991	52	42	8	25	5	4
1992	46	30	17	11	8	5
1993	58	46	9	26	5	12
1994	60	66	10	16	8	13
1995	47	57	9	19	4	9
1996	71	91	11	33	11	15
1997	73	71	14	32	12	14
1998	48	58	11	32	15	13
1999	63	60	9	16	8	12
2000	59	67	10	23	11	5
Chg 1 Yr	-6.3%	+11.7%	+11.1%	+43.8%	+37.5%	-58.3%
Chg 5 Yr	-2.3%	-0.6%	-7.4%	-12.9%	+10.0%	-60.3%

Source: TIS – Montana Department of Transportation

All of the above types of vehicles except fire trucks had crash numbers that were below the five-year average. Snowmobile involvement in crashes was down significantly in 2000. School bus and bus involvement in motor vehicle crashes was very similar to 1999 levels and still remains lower than in 1997.

11. Collisions with Animals or Avoidance

During the last 15 years, animal crashes and/or avoidance has steadily increased. Some of this increase is likely due to higher census numbers of deer and other wild animals. During a fifteen-year period, the reported number of motor vehicles that have collided with wild animals has increased from 468 to 1865. The key word in the previous sentence is 'reported', since many collisions with animals are not reported. When analyzing this increase, you must be aware that perhaps the percentage of collisions with animals being 'reported' is changing. For the first time since 1989, reported wild animal crashes did not increase over the preceding year.

Table 41
Collisions Involving Animals

Year	Collisions With Wild Animals	Collisions With Domestic Animals	Fatal Crashes Involving Animals
1991	746	225	3
1992	851	208	3
1993	868	212	3
1994	1203	269	1
1995	1305	287	6
1996	1363	248	1
1997	1501	239	3
1998	1575	259	2
1999	1871	296	2
2000	1865	237	2
Chg 1 Year	-0.3%	-19.9%	---
Chg 5 Year	+22.5%	-10.8%	-28.6%

Source: TIS – Montana Department of Transportation

12. Railroad Crossing Safety

Motor vehicle collisions with trains are a relatively rare event, but the severity of such collisions tends to be very high. Table 42 presents a history of these collisions on public roadways in Montana for rural roads and for all roadways. The twenty-two crashes with trains were a relatively average number over the last ten years. Only three of these crashes were not at a rural location. There appears to be no trend, as the fluctuation seems to be produced by the statistical chance of a rare event.

Table 42
Collisions with Trains

Year	Rural			Total		
	Crashes	Fatal Crashes	Injury Crashes	Crashes	Fatal Crashes	Injury Crashes
1991	14	0	4	20	0	4
1992	11	1	6	16	1	7
1993	13	5	5	21	6	9
1994	18	0	8	23	0	10
1995	11	2	4	16	3	5
1996	24	3	10	27	3	11
1997	20	0	11	28	0	16
1998	16	2	6	24	2	11
1999	11	1	4	12	1	4
2000	19	1	6	22	1	6
Chg 1 Yr	+72.7%	---	+50.0%	+83.3%	---	+50.0%
Chg 5 Yr	+15.9%	-37.5%	-14.3%	+2.8%	-44.4%	-36.2%

Source: TIS – Montana Department of Transportation

F. COUNTY RANKING

The following section places a ranking on the 56 counties in Montana. Each county is ranked from 1 to 56 in the following areas: Severe injury crashes (crashes with a fatality or incapacitating injury) and alcohol related crashes.

Table 43
County Ranking for Traffic Safety Programs

Rank	County	Severe Crash Rank	Alcohol Crash Rank	Sum of Ranks
1	Missoula	1	2	3
1	Yellowstone	2	1	3
3	Flathead	3	3	6
4	Gallatin	4	5	9
5	Cascade	6	4	10
6	Lewis and Clark	5	6	11
7	Ravalli	7	8	15
7	Lake	8	7	15
9	Silver Bow	10	9	19
10	Lincoln	9	13	22
11	Glacier	12	11	23
12	Big Horn	13	12	25
13	Carbon	14	14	28
13	Hill	18	10	28
15	Jefferson	11	19	30
16	Stillwater	16	16	32
17	Park	17	17	34
18	Powell	14	21	35
19	Roosevelt	21	15	36
20	Sanders	21	17	38
21	Beaverhead	20	19	39
22	Deer Lodge	19	23	42
23	Fergus	21	22	43
24	Mineral	21	25	46
25	Custer	29	23	52
26	Richland	29	26	55
27	Rosebud	28	30	58
27	Granite	26	32	58
27	Phillips	29	29	58
27	Broadwater	26	32	58

Table 43 (continued)

County Ranking for Traffic Safety Programs

Rank	County	Severe Crash Rank	Alcohol Crash Rank	Sum of Ranks
31	Teton	21	39	60
32	Madison	34	28	62
33	Toole	32	32	64
33	Sweet Grass	33	31	64
35	Valley	40	27	67
36	Blaine	34	36	70
36	Pondera	34	36	70
36	Musselshell	34	36	70
36	Dawson	38	32	70
40	Meagher	38	41	79
41	Daniels	40	42	82
42	Chouteau	42	42	84
43	McCone	44	42	86
44	Wheatland	45	42	87
45	Judith Basin	42	47	89
46	Sheridan	51	39	90
47	Liberty	45	46	91
48	Wibaux	45	47	92
49	Fallon	45	49	94
49	Powder River	45	49	94
51	Prairie	45	52	97
52	Golden Valley	51	49	100
53	Treasure	51	52	103
54	Carter	51	55	106
55	Garfield	56	52	108
56	Petroleum	55	55	110

Source: TIS – Montana Department of Transportation

The two ranks are summed and then those totals are ranked. This table can be used as a very general ordering for traffic safety problems by county. Some counties will have special safety problems that are not represented by the above table. Many counties may not have sufficient resources to manage an attack on their safety problems.

Cost benefit is a factor when aiding counties. If a large benefit can be gained with a small amount of money, this could override aiding a project in a higher priority county. Since there is a limited amount of funding to attack the problems, these factors may override others. Missoula and Yellowstone remained tied with the highest rank (lowest ranking points). Hill and Carbon counties moved up significantly within the ranking. As populations change, Montana is becoming more and more the big nine counties and the

little forty-seven. Ravalli and Lake counties continue to increase in population and have for the most part joined the 'big seven' of the past.

This compilation contains a large amount of varied data. There is much "noise" in the various data within traffic safety, since there are many variables that can affect crashes. It is difficult to reach significance because of these many factors along with the relatively small number of crashes and fatal crashes in the state. This paper should be used as a guide when looking at the traffic safety problem, along with common sense, when attempting to solve Montana's problems in traffic safety.